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THE MODELMAKER

FOR THOSE
INTERESTED IN MAKING
WORKING MODELS

Edited by

W. EDMUNDS SPON

VOLUME II

SPON & CHAMBERLAIN

Publishers of Technical Books

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1925

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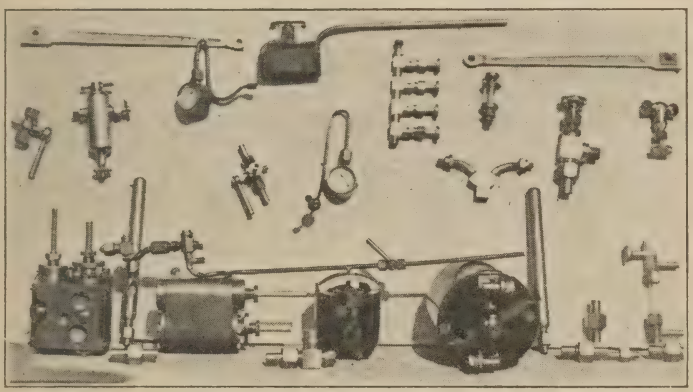

Finished Parts for a Locomotive made by Mr. Jas. A. Joslin, Sec. Canadian Model Engineering Club, of Toronto.

This is one of the Club's Exhibits at the Canadian National Exhibition held at Toronto last fall.

THE MODELMAKER

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OUR FOREWORD

In January, 1909, The Bassett-Lowke Co. commenced the publication of a very interesting little Magazine. MODEL RAILWAYS AND LOCOMOTIVES. Especially devoted to the design and construction of Model Locomotives, cars, railway equipments and permanent way. The illustrations and drawings were excellent and the reading matter very explicit. One of the principle contributors was Mr. Henry Greenly. Owing to its rather limited field it was difficult to get the necessary support to make it a paying proposition. After struggling along for some years trying to make it self-supporting the proprietors gave it up and sold out.

Under new management it struggled along for some years when it again passed into other hands. The new proprietors changed its name to EVERYDAY SCIENCE, adding a number of pages of general scientific information but still keeping the Model Railway Section intact. Mr. Arthur W. Line contributed a number of very interesting articles on Model Railway Work. Unfortunately the support it should have had from Model Railway Enthusiasts was not forthcoming so with the Oct., 1923 issue, (15th Vol.), it passed out of existence.

From the very start it had been a well printed and profusely illustrated paper. The best ever published on this subject. A number of our American Model-makers were subscribers and it was a great disappointment to them when it ceased publication.

News comes from London that after numerous requests from many readers of The Model Engineer, Mr. Percival Marshall has decided to commence the publication of a new Magazine, THE MODEL RAILWAY NEWS. We can all rest assured that Mr. Marshall will do his very best to make this new venture a better Magazine than the older paper but its ultimate success depends upon the hearty support of all those interested in Model Railways.

It will not treat the subject from the strictly engineering standpoint. That part will be taken care of in The Model Engineer. Mr. Marshall's aim will be to fully cover the much broader field of the planning, equipping and operating of Model Railway systems.

From the elaborate prospectus we have before us we note that Mr. Henry Greenly and other well known writers have promised to contribute regularly, and arrangements are being made with foreign correspondents to keep the Editor informed of what Model Railway Enthusiasts abroad are doing. There will also be descriptions of private systems, correspondence, notes and queries, trade doings and a Dept. for Sale and Exchange. In fact every effort will be made by the Publishers to make it indispensible to those interested.

OUR FOREWORD—Continued

It will be issued monthly. The edition will be limited to subscribers and single numbers will not be sold separately. This is to eliminate the financial loss caused by quantities of unsold odd copies being left on the publisher's hands.

We have placed our order for a limited number of subscriptions the price of which will be $2.50 per annum postpaid.

We appeal to our many readers who are interested in this special branch of Model Work to give Mr. Marshall their loyal support. because upon them rests the responsibility of making it a financial success or a failure like its predecessors.

Send us in your subscription at once and show Mr. Marshall in a practical manner you fully appreciate his efforts to supply you with a really worth while Magazine catering to your particular interests.

No other man has done so much to advance the interests of Scientific Model Making as he and his staff have done and nothing will make them happier than to feel that their labors are meeting with the success that they deserve.

DO IT TO-DAY.

In closing we wish you all a Very Happy and Prosperous New Year.

---The Publishers.

A Bench Shaper

By Preston M. Williams

I hope to devote considerable time to modelwork from now on and (having had some experience with machine tools) know that the man who works without them, while deserving credit is severely handicapped.

With your permission I am going to tell you of our activity down here.

Before beginning on the actual models my chum (G. R. Townsend, Watchmaker) and I are equipping ourselves with a shop suitable for the work in hand.

We already have between us a jeweller's precission lathe and attachments, 12-inch engine lathe, tool grinder and an equipment of micrometers, indicators and small tools usually found in a Machinists kit.

The last addition is a Bench Shaper which we have just built and of which we are very proud. The design of this machine which appeared in Popular Science about a year ago by J. V. Romig, looked promising, but we felt that it could be improved. We have used the general idea but have added some refinements and changes which have resulted in a machine which we feel will be of great assistance to us in our proposed work.

Our biggest problem was in gaining access to tools big enough to handle the job. This difficulty was overcome in the following manner. We joined the night school class in Mechanics and used the shaper as our project for the year. The school has an excellent universal milling machine. I made the necessary patterns and the local foundry produced the castings. We did the lathe work at home and devoted our class time to milling.

I must give extreme credit to the instructor, Mr. W. E. Russell, whose bag of shop kinks is

the best outfit I have ever seen.

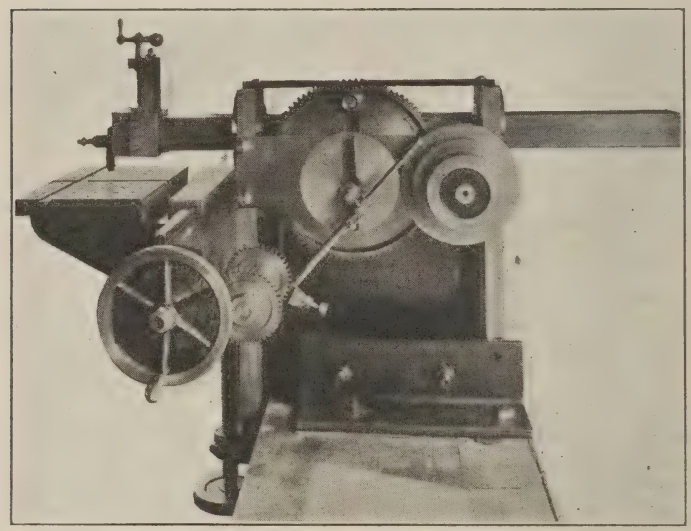
I am enclosing a print of the machine (counter shaft finished but not shown) and list the following specifications:

Frame—Channel Iron Angle Iron and ¾" x 4" C. R. steel.

cross feed both directions with adjustable speed.

Verticle Feed Screw—¾ x 10" square thd. hand operated and graduated in thousandths. Feed 8".

Tool Box—Regular shaper



Bearings—Bronze split for take up.

Lead Screw Nuts—Bronze.

Bull Gear—Aprox. 8" Dia. 12 P. 93 Teeth Driven by 16 tooth pinion.

Ram—Adjustable stroke 1½" square x 21" long. (Stroke 2 to 6 inches and may be placed at any point on table.)

Cross Slide—21" x 4" ground to within .0002".

Cross Lead Screw—⅝ x 10" square thd., collar graduated in thousandths, feed 10". Power head, may be set for any angle, has 2" up and down feed and takes 5/16" high speed bit.

Table—6" x 10" grooved for vice and pierced for hold down.

Capacity—6" x 8" x 10" and has turned out work accurate to within a thousandth.

The machine cost us (not counting labor) about thirty dollars and is worth it to us.

We are now building an eight inch screw cutting lathe and hope to add that to the outfit in the near future.

HIGH SPEED STEAM ENGINE

8 CYLINDER UNIFLOW, POPPET VALVE TYPE

By F. DRAYTON GRIMKE

The writer was accorded the privilege of inspecting and examining a new type of Steam Engine for a Model Power Boat.

Mr. Anton Bohaboy, the designer and builder is to be congratulated in having produced an engine of this type.

It is of the uniflow, poppet valve design and has the appearance of an internal combustion engine. This engine, on a block test, turned over at 6000 R.P.M. with 110 lbs. steam. When installed in a boat, 6' 0" long by 17" beam, the steam pressure was increased to 200 lbs. The engine turned over at 6000 and drove the boat at the rate of 25 miles per hour.

ENGINE—The engine weights 9 lbs. and has an overall length of 14½". (Figure 1.) The intake manifold is not shown, it screws on to the steam chest.

The crank-shaft (Figure 2.) is supported at either end by a double set of "New Departure" ball bearings and ranges in diameter from ⅜" at the head end to 7/16" at the back end. It was turned out from a solid piece of 1¼" Round Machine Steel Bar and took about 32 hours to make. There is a split bronze bushing between every pair of cranks. The illustration does not bring out the details very clearly but will show to some extent the amount of labor entailed in making it.

The crank-shaft is eight throw with 7/16" crank-pins.

The cam-shaft is similar to those used in automotive practice and is made from ¼" drill rod. It is directly geared to the crank-shaft with a 1 to 1 Ratio.

The cam-shaft has the same bearing arrangements as the crank-shaft.

The crank-case is made of aluminum in halves and bolted together.

The cylinders are of steel and have a ⅝" bore by a ¾" stroke. The cylinder covers are made of aluminum and shaped like a large screw with 27 threads to the inch. This form of cover, makes the cylinders more accessible for repairs or adjustment than the ones of the usual type.

The pistons are made of cast iron, with two rings above the wrist-pin. The piston rods are made of drill rod and have the Main Bearings of split bronze bushed.

Valves. These are of the poppet type and work in a chamber

somewhat resembling a union. The tappets and general arrangement are like the valve arrangement of an automobile engine. The valves are of silver steel.

Figure 3 is a typical cross section of the engine.

BOILER—The boiler is also of special design and holds about 1 gallon of water and delivers steam at a pressure of 200 lbs. for the duration of 8 to 10 minutes.

The length over the casing is 19" and about 8" to 10" wide.

The barrel is made of No. 16 gauge seamless Shelby steel tubing 5" in diameter by 15" long. There are 40, 5/16" steel water tubes, arranged in 2 parallel rows running longitudinally. The superheater pipe is 8'-0" long.

The heads are 5/32" steel and tied together by a ½" steel rod, threaded on each end and fitted with nuts.

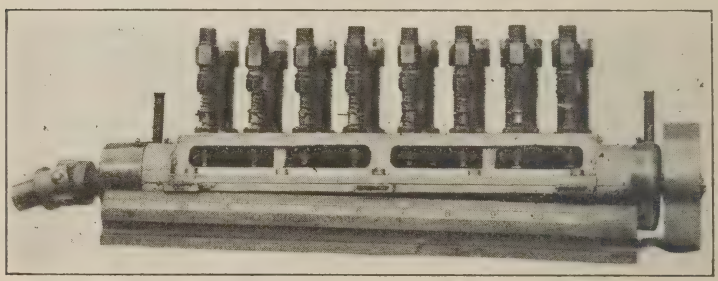


Fig. 1.

The whole boiler is brazed and silver soldered after assembling. The boiler was subjected to a hydrostatic pressure of 1450 lbs.

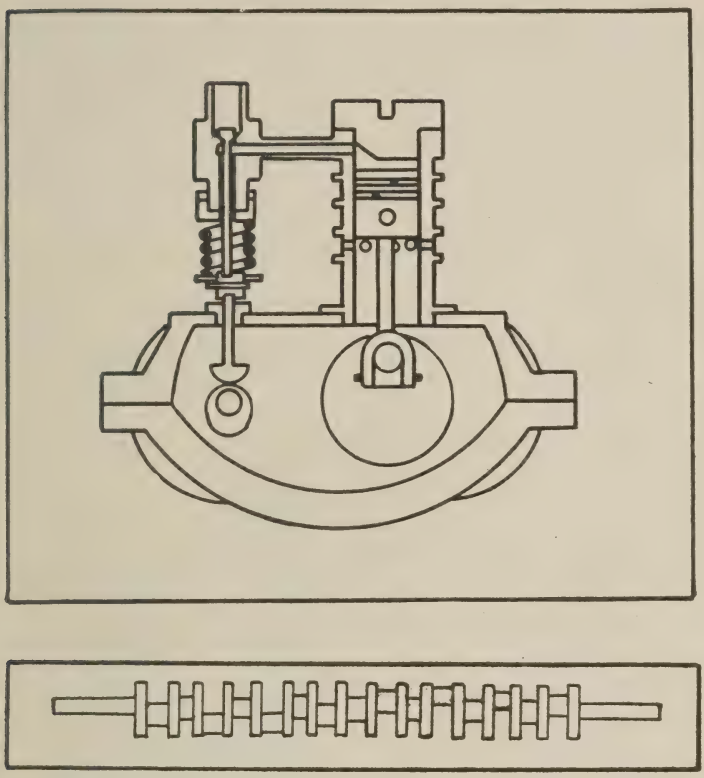
BURNER—The burner is of the usual and accepted design of the air pressure torch system.

The burner tube is 1¾" diameter by 6" long and has 12 turns of ¼" steel tubing around the outside.

The gas tank is 7" long x 4" diameter and has the usual needle and air valves. The tank capacity is 1 quart and lasts about the same length of time as the water in the boiler.

FITTINGS—The boiler fittings consist of a special safety valve with a 5/16" seat, and set to blow off at 200 lbs. pressure. A special throttle for this boiler was made and also a 200 lb. pressure gauge.

The engine is provided with a displacement lubricator 2" dia. x 6" long.



Figs. 2 and 3.

The next exhibition of the Ship Model Society, will be held Feb. 9 to 24 at the Fine Arts Building, 215 West Fifty-seventh Street. It will include all good ship models, whether owned by members of the Society or not, provided the owners are not dealers. Any one wishing to exhibit is asked to communicate with the Secretary of the society at 36 West Forty-fourth Street, sending a photograph of the model at least 5 by 4 inches. It is particularly desired to secure models which have been constructed by their owners, and all amateur shipbuilders are requested to submit pictures of their work. The jury will notify the exhibitor if the model is accepted and send shipping directions. In previous exhibitions only models owned or made by members have been exhibited.

DETROIT MODEL YACHT CLUB

By H. C. FIELD

As requested in your letter of recent date am sending you an account of our last meeting and details connected with same.

The Detroit Model Yacht Club held its regular monthly meeting on December 4th, at which all prizes won in Club races for the year were awarded. Following is a list of prizes and winners:

SAILBOATS

Trophy—D. Y. M. C.; Class—Class C trophy; Won by Peter Pan; Owner, W. Stevenson.

Trophy—D. M. Y. C.; Class—Class D trophy; Won by Bluenose II; Owner, N. Taylor.

Trophy—D. M. Y. C.; Class—Five mile trophy; Won by Peter Pan; Owner, W. Stevenson.

Trophy—Commodore, Class—Sweepstakes Cup; Won by Peter Pan; Owner W. Stevenson. 2nd Place, Sweepstakes Prize, G. Steinbrecher.

Trophy—City of Detroit; Class—Free for All; Won by Embree; Owner, H. A. Miller.

POWERBOATS

Trophy—D. M. Y. C., 1" Piston Disp.; Class—Displacement Hull; Won by Gladfly; Owner, H. C. Field.

Trophy—City of Detroit, 1" Piston Disp.; Class—Displacement Hull; Won by Bluebird I; Owner, S. E. Field.

Trophy—City of Detroit, 1" Piston Disp.; Class—Hydroplane Hull; Won by Marguerite; Owner, E. C. Chute.

Following the presentation of prizes was the Election of Officers. The following being elected:

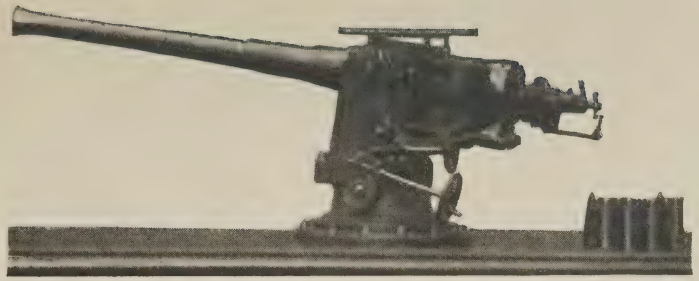
Commodore, E. C. Chute; Vice Commodore, G. Steinbrecher; Rear Commodore, W. S. Palmer; Fleet Captain, A. C. Stahl; Measurer, W. Stevenson; Treasurer, J. F. Clark, 5 Superior Blvd., Wyandotte, Mich.; Secretary, H. C. Field, 323 Ontario St., Windsor, Ont., Canada.

Plans were made for an even more successful year than that just passed.

Should there be any Model Sail or Powerboat enthusiasts wishing to join the Club I would be glad to have them write to the secretary.

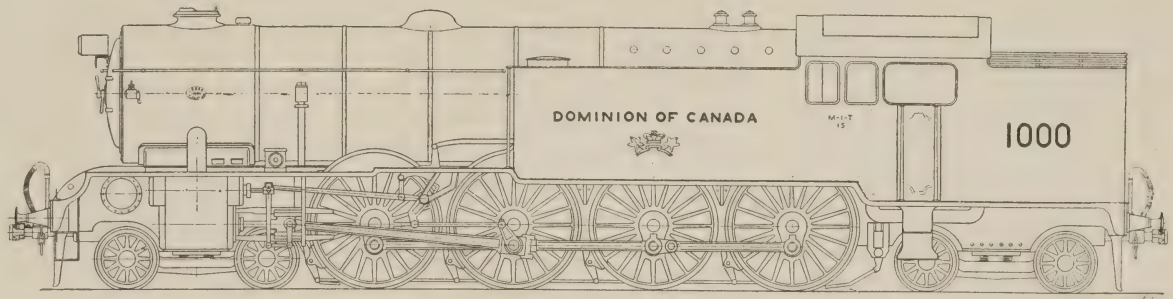
The Detroit Model Yacht Club usually have two Exhibitions of Models each year which are always well attended.

We have had so many requests for our Power Boat Ratings and our Racing Rules that it occurred to me their publication in the Modelmaker might be of interest to many of your readers.



MODEL OF A 6" GUN

Model of a 6" Brtish Naval gun about 12" long, made by Mr. H. W. Spence, of Toronto. The scale is 1/16". The base and jacket are steel castings; the barrel, breech block and its locking parts are also of steel; the gears and other parts are of Vanadium bronze. The breech block is the Williams or intercepted screw type and when in position it is securely locked by a 1/6 revolution. The gun is fitted with elevating and traversing mechanism, telescopic sight, and automatic recoil. It is a perfect working Model and fires a .38 revolver cartridge.



4-8-4 "DOMINION" TYPE THREE CYLINDER HEAVY DUTY TANK LOCOMOTIVE 2½ GAUGE

Mr. Jas. A. Joslin is now at work on this fine model.
The Gun was another of the C. M. E. C.'s exhibits at the Canadian National Exhibition, Toronto.

TOLEDO MODEL YACHT CLUB

By COMMODORE D. A. HEINLE

The Toledo Model Yacht Club was organized for the sole purpose of designing building and racing of model boats, and it is our aim to interest boys and men in boats and eventually get them interested in large boats and make yachtsmen of these students and not let this game die out.

Our club have adopted two classes of sailboats, the B & D. The B boats are the modified lines of the famous "Polka Dot" and the D class are a modified "Star"; this class is suitable for beginners as the boat will have straight sides and rounded bottom and will be easy to build. Both classes to be of one design and the one winning a race will be the best sailed. The difficulty with most clubs is that they have different designs and one boat will win all the races and the boys get discouraged. This we will overcome.

The Power boat classes have not been decided upon.

Our letter head is the lines of our modified "Polka Dot," and is used on the Membership cards as well as the application blanks and the design works out in a very pleasing manner.

Dues are $3.00 for Seniors, $1.00 for Juniors and money to be used only for postage and prizes.

Our meetings are held at the various Toledo Yachts Clubs, five in number, and they are very glad to have us as it eventually means members for them.

From all present appearances we will have quite an organization as all the yacht clubs are backing us and the newspapers give us all the write-ups we want.

January 10th to 20th we will have a model exhibit at the Commerce Guardian Bank & Trust Co. Have more models than we can exhibit.

Officers are as follows: D. A. Heinle, Commodore; J. A. Tallman, Vice Commodore; C. H. Bowers, Secretary and Treasurer; V. P. Darlison, Sailboat Measurer; F. Froelich, Powerboat Measurer.

Club flag has not been decided on will give it to you later on.

Any other information glady given all applicants.

All applications for membership can be forwarded to Mr. D. A. Heinle, care of Meilink Steel Safe Co., Toledo, Ohio.

BOOK REVIEWS

Upholstery, Clearly and Simply Described, by John Davies, 63 pages, 5 illus., 7¼ x 4¾ in., paper, 35 cents.

The author arranges his information as follows: Stuffing materials; Tools and equipment; Covering material; First stuffing; Second stuffing; Divan chair spring edge; Back and arm; Covering; Various styles of upholstering; Buttoned work; Renovating.

Graining and Marbling, by W. L. Savage, 63 pages, 4 illus., 7¼ x 4¾ in., paper, 35 cents.

In this small handbook the author confines himself strictly to an explanation of the different colors and megilps used, with full instructions and directions as to their application and mode of working, in such simple language that the beginner in this art may readily understand and be able to perform the various stages of the work successfully.

The Clock Book, by Wallace Nutting, being a description of foreign and American clocks. 312 pages, including 142 page plates, 10¼ x 7 in., cloth, $5.00.

This work deals exclusively with old foreign and American clocks, calling special attention to the features of peculiar decorative interest, and not dealing with the mechanical aspect. It will appeal specially to the collector of old clocks. The many beautiful plates add greatly to the value of the work.

River and Canal Engineering, by E. S. Bellasis, 2nd edition. VII—337 pages, 176 diagrams and 7 page plates, 9 x 6 in., cloth, $6.00.

The characteristics of open flowing streams and the principles and methods to be followed in dealing with them. The author embodied his experience gained in many years of practical work spent amongst streams.

The present edition has been practically all rewritten and a great deal of new matter added. This work should be in the library of every engineer who is interested in this important subject.

A Complete Guide to Bricklaying, by T. J. Forbes, 64 pages, 14 illus., 7¼ x 4¾ in., paper, 35 cents.

Owing to the high cost of brick work at the present day this little guide will be welcomed by many practical men who would like to do the work themselves. The author commences at the elementary stages and gives a clear explanation of how to do it, including explanation of terms, the tools required and the various materials used.

Two-stroke Motor Cycles, second edition, revised and enlarged. 195 pages, 119 illustrations, 7¼ x 4¾ in., boards, $1.00.

Since the publication of the first edition the development and perfecting of the two-stroke cycle motor has been very rapid. Most of the minor drawbacks have been eliminated and this type of motor-cycle in consequence has become very popular. It was found necessary therefore to thoroughly revise this work to bring it up to date.

A Correction

In the November issue of The Modelmaker under the list of Societies we gave the name of "The Canadian Society of Model Engineers." This should have read "Canadian Model Engineering Club," Montreal Branch, Mr. F. L. Lewis, Secretary.

The Chicago Society of Model Engineers did not have their usual Fall Exhibition of Models, which has always been a feature of their years work. But they hope to arrange for an Exhibition of Models early this spring.

Model Engineer, the principle contents for the November and December numbers are Model Overtype Engine and Boiler; How the Steamship Grew Up; A Railway Class 3 Cylinder Locomotive Instruction Model; Useful Switchboards; Model of S.S. Berengaria; Construction of the "M.E." Four-pole Dynamo; Electrical Clocks; Many Models Built by Mr. W. G. Stark; Reminiscence of a Model Engineer's Career; A Simple Blower; Commercial Engineering Models; The New Eskdale Locomotive; Combined back-gear and Countershaft for the Lathe; Walschaerts Valve Gear for small-scale Locomotive; Machining the Components of a Model Vertical Steam Engine; Locomotive News and Notes; Improvements to an Old Type Four-cylinder F. N. Motor Cycle Engine; Shops, Shed and Road; Queries and Replies; In the Moulding Shop; Workshop Topics; Practical Letters from Our Readers; Society and Club Doings. (Eight Numbers 1228-1235, 14 cents each.)

One of our correspondents writes he understands a Model Boat Club was organized this year in St. Johns, N. B. That some very fine model sail boats have been built by some of the members. But so far no model power boats have been constructed. We would like to get in touch with the Secretary, could anybody send us his name and address.

Model Boat Club. We understand there is a Model Boat Club in Washington, D. C. We shall be very glad to receive full particulars of this Club with the name and address of the Secretary.

Mr. Berg has commenced the construction of a Southern Pacific 4-4-0 Class E 28 Loco. with Vanderbilt tender. He obtained the castings and blue prints from The American Model Locomotive Co. The boiler will be heated with a gasoline burner from fuel carried in the tender. He is well pleased with the drawings and castings and speaks very highly of the excellent workmanship of the cylinders and wheels, which he purchased machined and finished.

Mr. Cecil G. Hamilton writes he has purchased a set of drawings and castings from Mr. Coventry of his P. R. R. K. 4S Passenger Locomotive ¾" scale and is at work on the construction of this fine model which he hopes to have completed some time this year. The drawings are excellent and the castings very good.

The American Model Locomotive Company report they have moved into larger and more convenient quarters to enable them to give better attention to their Model business, which has increased very much during the past year. They will now be able to turn out the machined and finished parts much quicker with their increased facilities.

Alfred Paul & Son have been appointed Sole American Agents for the well-known English firm Stuart Turner, Ltd. These goods are well suited for Schools, Manual Training Classes and for the Model Engineer in general. They can supply finished models, sets of castings in the rough, or sets partially machined. They have in stock copies of the finely illustrated Turner catalogue, price 25 cents. We can recommend these goods as first class as we handled a good many of them ourselves before the War. Send 25 cents and get a copy of this catalogue which is full of useful information for the Model enthusiast.

Railway Map of the Dominion of Canada 1924. Scale 35 miles to 1 in. Four sheets, size 28" x 52" joined together to form 1 map, price 80 cents. National Resources Intelligence Service Canadian Dept. of Interior, Ottawa, Canada. This map will interest some of our Model Railway Enthusiasts.

Mr. Ben Calvert, of Vermilion, Alberta, Canada would like to hear from any Model enthusiasts in his section with a view to starting a Model Engineer's Club.

Any of our readers who are contemplating fitting up a workshop before purchasing their machinery should write to the Triplex Machine Co. for an illustrated circular describing their Triplex Combination-Lathe, Milling and Drilling Machine. This tool should interest every Manual Training Teacher who has charge of Metal Working Classes. The Triplex Machine Co. will be glad to give full particulars.

The Gerold Company advise us that they expect to have ready within a month or two another addition to the famous line of WADE bench lathes. It will be a bench drill of workmanship, design and finish equal to the WADE bench lathes and, at a price, within reach of the most modest purse. While going to press we cannot say exactly anything further as regards the dimensions and capacities but we hope to be able to fully describe the new tool to our many readers in the next issue of the Modelmaker.

The American Model Locomotive Co. can now supply American type rolled brass rail for 2½" scale track.

Mr. Douglas Getty writes he has now ready drawings of Steel Pullman Sleeper for "O" gauge and is planning to get out the castings and parts for its construction in the near future.

Have you got your bound copy of The Modelmaker Vol. I, 1924? The supply is limited. Send us your order before the stock is exhausted.

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Locomotives, ½ inch and ¾ inch scale P. R. R. K 4 S Pacific drawings and castings rough or finished supplied. Real model engineering. H. J. Coventry, M.E. 4003 Carlisle Ave., Baltimore, Md.

Vertical Piston Valve Engine, ⅝" bore ¾" stroke. Complete set rough castings, materials and screws with print, $5.00 post extra. Finished parts also supplied if required. H. J. Coventry, M.E. 4003 Carlisle Ave., Baltimore, Md.

Machine Work to customers requirements. Submit full particulars for estimate. H. J. Coventry, M.E. 4003 Carlisle Ave., Baltimore, Md.

Two Wade Bench Lathes never used. Too small for my work. L. S. Gay, 8 Julian Terrace, Norwich, Conn.

Mr. Douglas Getty reports quite a demand for sets of his Locomotive castings. Write him for full particulars and prices.

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Models, Railways and Locomotives, back nos. and Vols. in good condition. Box 10, Modelmaker.

Everyday Mechanics, Nos. 1 2 and 6 of Vol. 1. Nos. 1 2 and 3 of Vol. 2. Box 2, Modelmaker.

American Institute of Elec. Engrs. Volumes 1 to 8. Box 4, Modelmaker.

The Bathe Mfg. Co. have in preparation a new and enlarged edition of their illustrated Catalogue of Model Engines, boats and model supplies. They make a charge of 20 cents, which is refunded on receipt of order.

Mr. W. Lloyd Reeve writes he is a machinist by trade and has been interested in model work for some time. He has in preparation a number of dies for standard sized model car wheels. He is prepared to do machine work for any of our readers and would be glad to give estimates on receipt of specifications.

Mr. K. W. Bash of Detroit was in New York recently and had a very pleasant visit with us. We are always glad to see our old friends when they visit New York.

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½" bore, $12.75, or ⅝" bore, $15.75. You will probably wish to make your own model boat hull, but what about your power unit? We are builders of working model engines and boilers of many types. We can supply you with a power unit that will meet the requirements of your particular model boat. Boiler, Ship and Naval fittings. Special work. Large illustrated catalogue, 20c.

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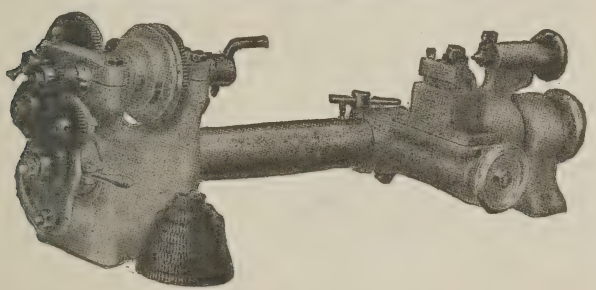

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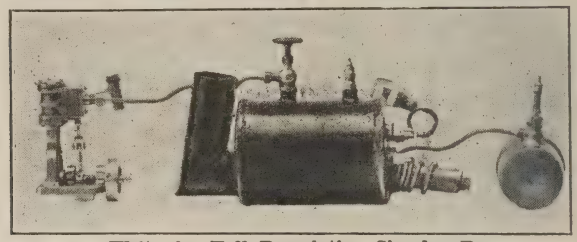

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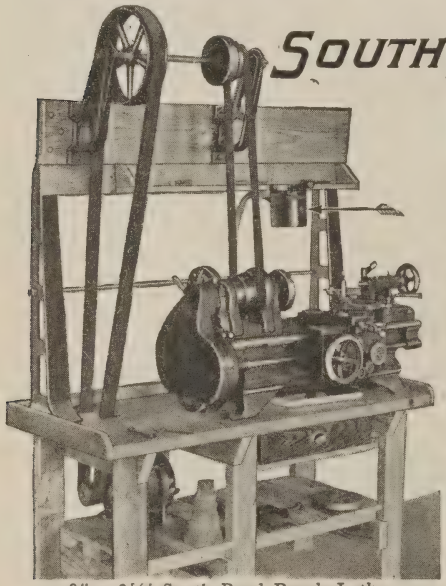

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THE MODELMAKER

VOL. I.—1924

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THE MODELMAKER

FOR THOSE
INTERESTED IN MAKING
WORKING MODELS

Vol. II., No. 2 FEBRUARY, 1925 10 Cents

Model of H.M.S. "Victory",
Admiral Nelson's Flagship at the Battle of Trafalgar,
Oct. 21, 1805, built by Mr. G. B. Douglas.

THE MODELMAKER

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120-122 LIBERTY ST., NEW YORK, N. Y.
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OUR FOREWORD

The value of models may be considered from three different viewpoints: as a recreation or hobby, as an adjunct in teaching Students of Mechanical Engineering, and as a new mode of selling goods.

Our readers are more interested in the first—A Hobby—and as such it is of considerable value to the professional man as it gives him a change of thought—brain reaction. Therefore the more correct the drawings and the more perfect the workmanship the greater the pleasure and enthusiasm engendered by the work done.

The Modelmaker should therefore endeavor to select some piece of work that is not only pleasing to the eye but of real intrinsic worth, and in the preparation of the drawings for such a model, he will not only have pleasant recreation, but gain considerable knowledge of the actual construction and operation of the Prototype.

Models as aid to instruction in class work have been more or less in use for many years. They should be more universally adopted as in conjunction with the theoretical teaching, the student more quickly grasps the essentials and understand the principles of operation.

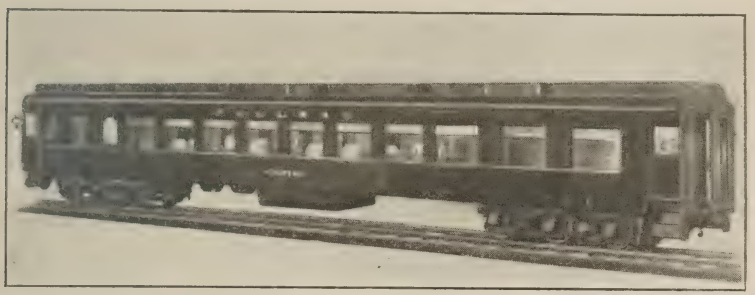
As a means of selling goods it is being adopted by some firms in England and the U. S. as it has been found by actual experience that a finely finished model more quickly attracts the attention and interest of a prospect and thereby produces quicker results for the salesman than he could get from photographs or a finely illustrated catalogue. There it is—the actual working model of the goods the salesman has to offer.

The use of models in salesmanship therefore lifts the making of models as a mere Hobby to the highest rank—The Profession of Modelmaking as a Commercial Asset.

We shall be pleased to receive descriptions of models with photos or drawings from any of our readers.

Mr. Cecil G. Hamilton is at work on some more designs of Models representing American type ships. He will have full size drawings for sale. We have already published in the Modelmaker, two very interesting illustrated articles on this subject from him, and we are sure many of our readers will be interested in his new articles when they are published.

Alfred Paul & Son, American Agents for Stuart Turner, Ltd., inform us they have had quite a number of inquiries from the readers of The Modelmaker. Beside the many fine Models and Castings Turner Ltd. produce, they manufacture an excellent ½ h. p. gas engine, just the power unit for the Modelmaker's workshop.



THE PULLMAN CHAIR CAR MODEL
"Wyoming"

The accompanying photograph presents a model of a Pullman chair car made by Mr. Donald M. Tiffany, of Bayside, L. I. It is built to a scale of one inch to the foot and is complete to the most minute detail. The car rests on two sixteen pound trucks, the wheels of which are castings of white iron and are connected with steel axles. These miniature trucks firmly constructed resemble the six wheel Pullman truck in every respect. The car is 6 ft. 10 in. long, 13½ in. high by 9¾ in. wide. Gauge is 4¾ in.

The body of the car is built of hardwood except the extreme ends which are made of galvanized iron. In each vestibule are found the respective doors and fittings all in working order, even to the buffer and end guard gate. Leading from the vestibules at either end of the car are the usual hallways, which give access to the chair section. With the ladies' dressing room at one end, the opposite end comprises a men's smoking and dressing room, completely equipped, including seats, washbowls, towels, etc. The floors of these rooms, the halls and the vestibules are covered with dark green linoleum.

The chair section is furnished with miniature revolving chairs upholstered with green cretone, and a white linen towel attacned over the back of each chair. On the floor of this section is a Brussels carpet of a rich dark green color.

The color scheme throughout the interior of the car is the standard mahogany finish, with a colonial yellow ceiling enriched with mahogany moulding, forming various panels.

There is a lighting system composed of sixteen electric bulbs of fourteen volts each, divided into three circuits, the halls and chair section are on one circuit, the dressing and smoking rooms on another, while the markers at the end of the car are on a separate circuit. The system is controlled from the battery box under the car in which are housed switches and a rheostat for lighting any desired section of the car. Current is supplied through a transformer.

This model which is a complete reproduction of a modern Pullman chair car was named "Wyoming" after the historic Wyoming Valley in Pennsylvania where the builder formerly resided.

DETROIT MODEL YACHT CLUB

Model Power-Boat Rating and Racing Rules

RATING RULES

Classification of Boats

Class.	Piston Disp.	Type of Power Plant.	Type of Hull.
1	1 cu. in.	Saturated steam	Displacement
2	1 cu. in.	Saturated or flash steam	Hydroplane
3	—1½ cu. in	Saturated or flash steam	Displacement or Hydroplane
	—2 cu. in. 2-cycle	Internal or combustion engine	Displacement or Hydroplane
	—4 cu. in. 4-cycle	Internal or combustion engine	Displacement or Hydroplane

Definitions:

Section	I	Piston displacement
"	II	Saturated steam boiler
"	IIa	Economizer
"	IIb	Superheater
"	III	Flash boiler
"	IV	Displacement hull
"	V	Hydroplane hull
"	VI	Area of deck

Section I. Piston displacement to mean the total piston displacement of engine, or auxiliaries, the power from which, whether partly or wholly used, is applied to propeller shaft or shafts. By piston displacement is meant, the cubical content of the volume displacement by the working strokes of a piston during one complete power cycle. As per example, a four-cycle internal combustion engine would have one working stroke for every two revolutions per cylinder, whereas, a double acting steam engine would have two power strokes per revolution for each cylinder.

Section II. A saturated steam boiler to mean, one in which there is a natural thermic circulation of water throughout, one in which the steam rises from the surface of the water in the main or upper drum which water must at all times be kept above entrance of water tubes. Where foaming type water tubes or headers are used, the delivery ends of same may be above water level. Steam to be taken from main drum or steam dome which must be connected to water drum.

Section IIa. An economizer, if used, to have not more than 30 sq. ins. of heating surface in contact with heating agent; all pipes etc. which are used to connect economizer to boiler to be considered as part of economizer and their heating surface must be considered as part of the heating surface of economizer.

Section IIb. The superheater, if used between boiler and main engine, to be not longer than four feet and, if larger than 5/16 O. D., it must not have more than 43 sq. ins. of heating surface in contact with heating agent.

Section III. A flash boiler to be considered as one which does not come within the foregoing classification, and may consist of either a continuous coil or may have suitable drums or chambers as a part of it; or one in which the circulation of water is forced.

Section IV. Displacement Hull. The hull must have no breaks in the longitudinal continuity of the immersed surface, not more than one lifting surface and must conform to the committee's ideas of what is generally classed as a displacement type. The keel and chine (or bilge) must be continuous and must extend from the bow to the stern or stern post. Steps either transverse or longitudinal will not be permitted. Surfaces on each side of the keel between the keel and the chine (or bilge) must be continuous and not contain breaks, jogs or notches of any description. There must be no movable plates, hinged devices or adjustable steps, or planes on the bottom of the boat which are intended to act as a lifting surface, and no catamaran type of construction. The chines must not project below the horizontal level where the planking joins the keel at any point in the same cross section of the hull or if the hull is of sheet metal of other construction the chines must not project below the horizontal level of where that point would be in the opinion of the committee.

Clinker built hulls are acceptable, provided, the laps of the planking do not project more than 5/32 of an inch where one edge of a plank overlaps another, which laps must face in approved clinker fashion. They must conform to the committee's ideas of what is generally classed as a clinker built hull.

The Sea Sled model is acceptable, provided, no part of the chines is higher than any part of the immersed surface at any point in the same cross section. The width at the chines must not be less than the width of any immersed portion of the same cross section of the hull. They must conform to the committee's ideas of what is generally classed as a Sea Sled.

Section V. Hydroplane Hull. The hull may have one or more breaks in the immersed surfaces, such steps or breaks to be either longitudinal or transverse. There shall be no catamaran type of construction. All hulls must conform to the committee's ideas of what is generally classed as a Hydroplane Hull.

Section VI. All boats must be decked in. The area of the decked-in portion to be not less than 1/3 of the total deck area.

CANADIAN MODEL-ENGINEERING CLUB

The following is a list of officers of the Canadian Model-Engineering Club for 1925:

Hon. President, Sir John V. H. Tulleken; President, R. V. Scott; Vice-President, Jas. A. Joslin; Treasurer, J. Gibbons, 60 Rockwell Ave., Toronto; Secretary, H. B. Cox, 123 Pacific Ave., Toronto; Assistant Secretary, Mr. Jennings, 110 Landsdowne Ave., Toronto.

The Club has a workshop for the benefit of those members who have none of their own. The workshop is also a regular meeting place every first and third Thursday of each month.

The members are, for the most part, busily engaged on the construction of Models for the coming Exhibit at the Canadian National Exhibition, August, 1925.

All of our Canadian readers interested in modelmaking should get in touch with Mr. H. B. Cox, the Secretary, and ask for particulars of membership.

The Montclair Model Engineers' Club of Montclair, N. J. held its annual dinner and election of officers Jan. 30, 1925 at High-gate Hall, Upper Montclair. Br. Wm. H. Hodgins was elected president to succeed Mr. Richard O. Reger and Mr. Frank A. Baker was elected secretary-treasurer to succeed Mr. Hodgins. Mr. George B. Douglas addressed the club, recounting personal experiences before the mast on the four mast Shenandoah. A splendid model of this ship, made by Mr. Douglas graced the table. The club looks forward to an active year in all its interests; model sailing, model power boating, and the building of display models and engines.

At the regular monthly meeting of the Detroit Model Yacht Club held on Jan. 8th it was decided to remove the headquarters of the Club from 504 Elmwood Ave. to 281 E. Grand Boulevard, such change to take effect immediately. An enjoyable time was had by all at this, the first meeting of the year. The Club colors are a pennant divided longitudinally into halves, the upper in yellow, the lower half in black respectively, with D. M. Y. C. superimposed in red.

Mr. W. F. McEwan, 571 Providence St., Albany, N. Y., would like to correspond with any Modelmakers in his vicinity, with a view of organizing a Model Engineer's Club.

80,000-LB. CAPACITY BOX CAR

½-in. Scale Model.

Mr. Roy Ashley

In building scale model rolling stock, the most important step is to select the best grade of wood material. This should be fairly soft, and as straight grained as possible.

Sugar pine comes nearest to being the perfect material for this purpose.

The sides, ends, and roof of the box car are cut from 3-32-in. stock, and mounted on an underframe of 3-16x⅜-in. beams, to which are fastened the two main beams ⅜x¼x¼-in. brass channels. These channels give realism to the car, as well as make a strong and positive connection with the trucks.

Castings are used wherever practical, such as coupler pockets, spindle beams, truss rod brackets and brake hand wheels. These last-named fittings give the model a very realistic appearance, and Model Makers should take pains not to leave out any small details such as corner plates, polling pockets, hand rails, etc.

The Model Maker who is about to build rolling stock for his railway should first of all make himself a disc sanding machine. This little tool is well worth the money and time spent in making it, for it not only enables him to make the wood parts faster, but it makes joints and finishes wood to a greater degree of accuracy, which would be impossible by hand. The most expensive part of this machine is perhaps the electric motor. One-eighth h.p. is large enough. The next part is the metal disc, about 8-in. in diameter, which is fastened to the motor shaft. The next item is the table. Secure a piece of cold rolled plate 3-16x6x10 in., and set this on a block of wood thick enough to bring the plate up to the motor centre line.

Garnet paper gives the best results. Take a sheet of Garnet paper and shellac the back side (use white shellac), then shellac the disc, and allow these to dry. Then shellac again and wait until both surfaces are sticky, then place the garnet paper on the disc and cut surplus paper off.

The machine is now ready to operate.

ADMIRAL NELSON'S "VICTORY"

By G. B. Douglas

It is an old saying that "The proof of the pudding is in the eating." I am enclosing a photo of a model of Nelson's "Victory," ⅛-in. scale. The hull is 28 in. over all, 6¾ in. wide and 7½ in. from rail to keel.

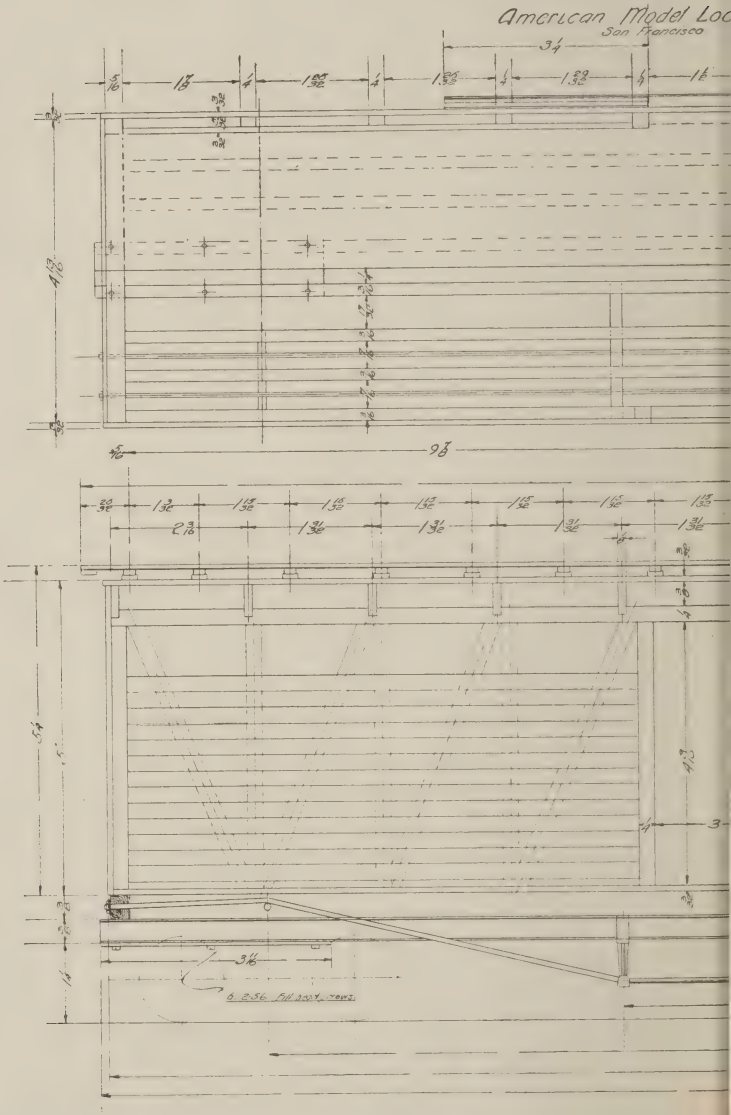
This model was made from my plans, an advertisement for which you have been carrying in your paper for some time, and which has brought me many inquiries for lists and a good many orders.

Years ago I determined to gather the plans of vessels for model makers and put them on the market at a moderate price so that models could be made to scale, and a "portrait" of the vessel as it should be.

I have had very good success and now am showing in the photo of Nelson's old flagship what can be done along those lines.

I have quite a large collection of drawings of lines and sail plans of famous sailing ships.

With best wishes for success to the Modelmaker and to yourself.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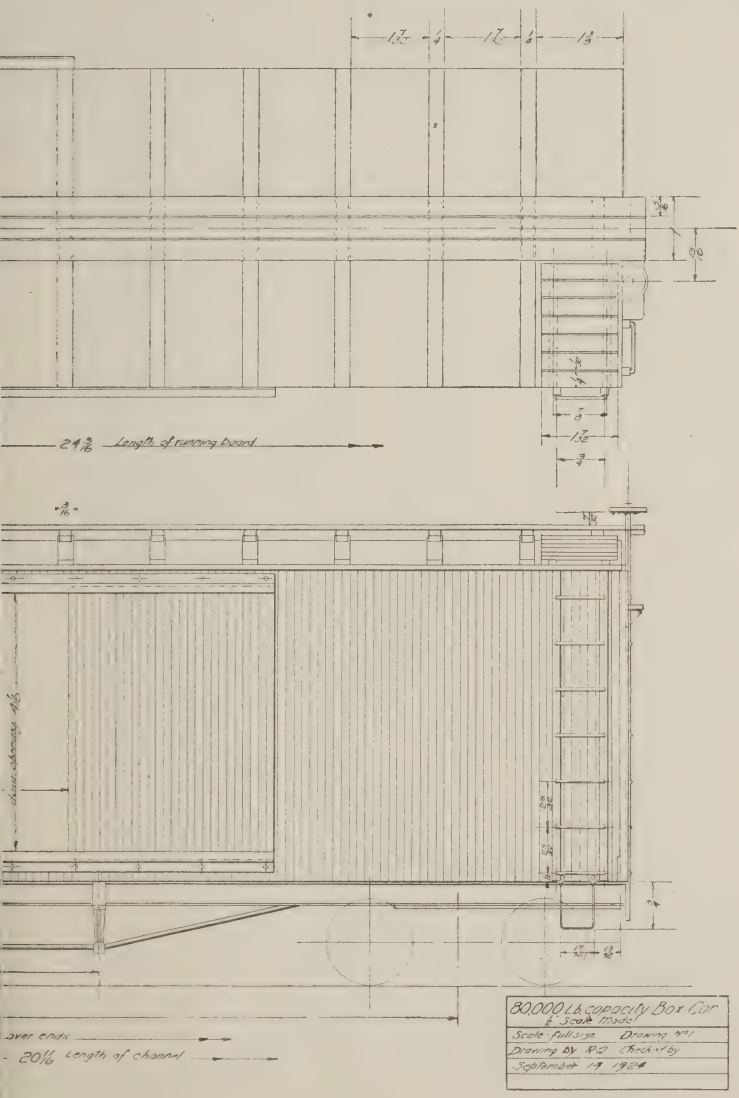

Length of running board
80,000 Lb capacity Box Car
Scale-Full size
Drawing No1
Drawing By R.D
Checked by
September 19 1924

SOME NOTES ON CONSTRUCTION OF ½-IN. SCALE K 4 S P. R. R. LOCOMOTIVE

By H. J. COVENTRY, Assoc. Mem. A.S.M.E.

In the July issue of Model Maker some notes were given of the general design of a model locomotive to ½" scale of the P. R. R. K 4S class passenger Pacific. The present article will deal with constructional features of this engine, and suggest methods of dealing with the actual work; not necessarily the only methods, as modifications would be required in individual cases to suit the builder's equipment. An elaborate equipment of costly lathe is not necessary to produce a successful model, as all parts may be turned upon quite a small lathe, such as now on market, with the exception, perhaps, of cylinder bores.

Possibly most amateurs would deal with the cylinders first, forming as they do a complete unit, which when finished gives considerable encouragement to proceed with the simple but more arduous work of making the frames.

Cylinders. It will be seen from drawings that steam ports are cut in a sleeve forming the steam chest, which is eventually pressed into cylinders. The cylinders are made in two parts, each part being identical, as is usual practice, bolted together along vertical face, which is on the center line of whole engine.

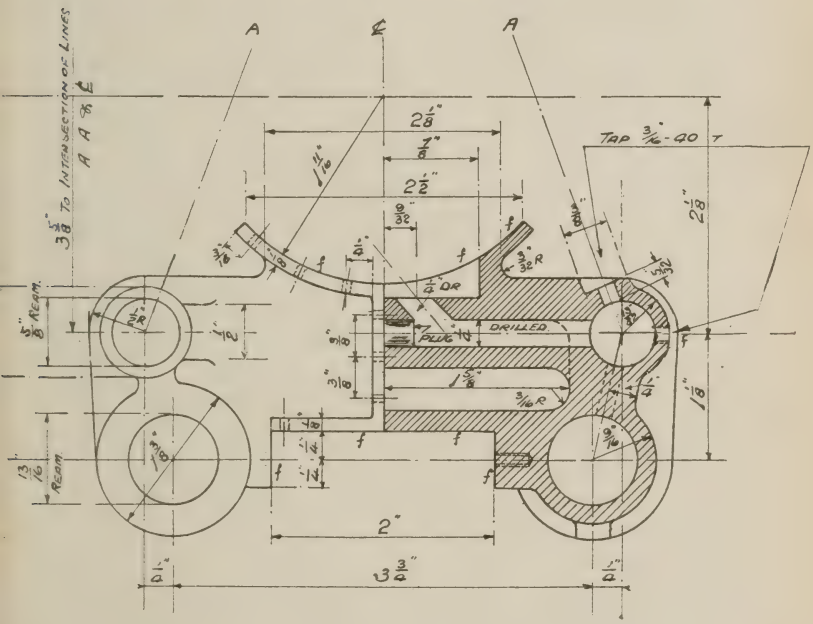
The machining of cylinders is a fairly straight forward job, if the operations are done in proper order.

The first operation is to check over casting in order to decide how much to take off the vertical inner bolting face. To do this, lightly drive in bridge piece in the core of cylinder bore. Then select a center so that the cover flange is concentric and at same time proper distance from center of steam chest. Having established these two centers transfer them to other end of cylinders, by means of surface plate and scribing block and square, packing up the casting until the best possible locations are found on the other end.

During this proceeding the casting should have the inner bolting face pointing upwards and it then becomes an easy matter to scribe a line all round this face at the correct distance from cylinder bore center. If the flange becomes too thin when the

amount indicated is taken off the original centers must be moved, and marking out gone over again.

Now the face may be treated up flat, either by file, or perhaps by mounting on lathe face plate. From this face the other two flat faces may be treated, but it would be advisable to bolt the two cylinders together for this operation, the other cylinder having already been treated similarly up to this stage. Next check the cylinders and steam chest centers, they should be very close to dimensions, if not they may be adjusted by placing each cylinder



on surface plate with the vertical face in contact with the S. P. and scribing round. Having reached this stage cylinders are ready for boring, and the best way to do this, if equipment allows, is to take the cylinders already bolted together, mount on cross slide at correct height; adjust on line of and square with lathe centers and bore out with boring bar running between centers. Move the cross slide over to the other cylinder center and bore through. The bores will now be in line with and parallel to each other.

Perform a similar operation for steam chest, but in this case a hole will have to be drilled first, as the casting is solid here, finishing up with boring bar. If the lathe will not permit of this procedure, it may be possible to do each cylinder separately in a similar manner, boring the steam chest and cylinder bore at one setting and facing the ends with a suitable cutter in boring bar.

The smoke box saddle may be bored out, by mounting the cylinder, on slides as before, and using a cutting bar of correct radius. With a little care, however, the saddle may be filed to a neat fit. Now take cylinders apart and drill the exhaust passage. The smoke box saddle flange may be drilled to a tenplate, the same tenplate being used later on for holes in smoke box. The steam port may also be drilled now.

Steam Chest should be turned, drilled and reamed at one setting from brass bar held in lathe chuck and parted off correct length. The ports should be accurately located, and either milled out with end milling cutter, or drilled, chipped and filed. A gauge is handy for getting correct size and relative location of port. The recesses need not be as accurate.

The outside die should be made between .0005 and .0010″ larger than the chest bore in cylinder, to allow of a forced fit. It need hardly be mentioned that the respective surface, should be quite smooth and free from tool marks as steam tightness as well as security must be attained. This sleeve is now ready for forcing into cylinder chest bore. Before doing so, scribe a mark on end, and another on cylinder, so that when they register the ports will be correct with drilled passage in cylinder. The sleeve may be forced in by placing it and cylinder in the vise, with lead or hardwood packing between the jaws, taking care to get the sleeve square. A very slight taper for about ½″ on sleeve will assist in this. Say .0005″ smaller than bore.

After the sleeve is pressed in, the drilling for steam pipe may be done.

Mount the cylinders at correct angle on cross slide, and at height to bring steam pipe on lathe centers. Put an end mill in chuck and mill out a square seat, as shown on diagram. Then follow up with the drill and run right through. The drillings for drain cocks, and the hole for exhaust pipe complete the cylinders at this stage.

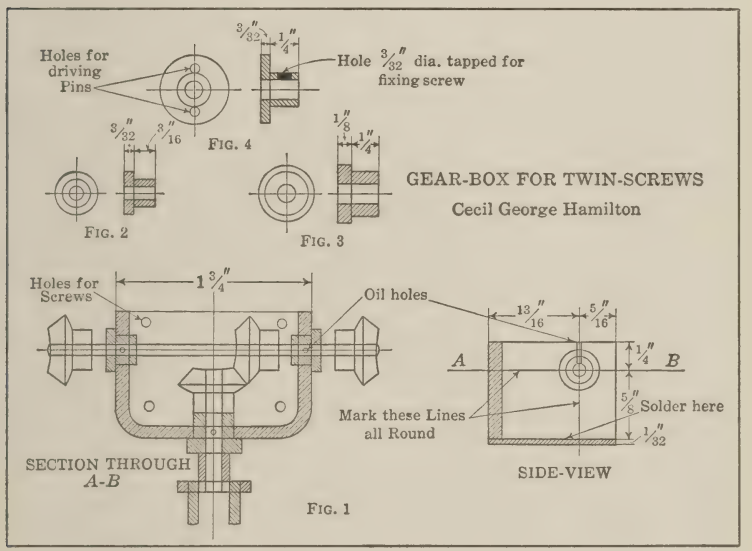
Covers should be chucked, turned and faced drilled and reamed for piston rod at one setting. The counter bore for gland is best produced with a counter bore cutter having a pilot, which is a nice fit in piston rod hole.

(To be continued.)

DESIGN FOR A TWIN-SCREW GEAR BOX.

By Cecil G. Hamilton

Some years ago the writer designed and built a model steamer, the idea being to have it as near scale as possible, and among other things this necessitated the use of twin screws. Having at the time a single cylinder engine it was intended to get another of the same design and place them side by side. hand was the body, and for this a strip of brass was obtained ⅛ in. thick and ⅞ in. wide, being bent to the shape shown in Fig. 1, care being taken to see that it was all square. With a surface gauge the centre lines were drawn in and the center of holes being popped in on both sides and front Fig. 1. A block of wood was next shaped to fit inside the body, preventing it from being distorted and the



Upon looking over the engine room space, it was found impossible to place the engines side by side and at the same time get them low enough in the vessel. Then after giving the problem some thought the gear box about to be described was designed. As well as adding to the efficiency of the finished ship the twin screws looked very well when out of water. The first part to be taken in hand was the body, and for this a strip of brass was obtained ⅛ in. thick and ⅞ in. wide, being bent to the shape shown in Fig. 1, care being taken to see that it was all square. With a surface gauge the centre lines were drawn in and the center of holes being popped in on both sides and front Fig. 1. A block of wood was next shaped to fit inside the body, preventing it from being distorted and the holes for the cross shaft and end shaft bushes were drilled with a ¼-in. and ⅜-in. drill respectively. The wood was then removed.

A piece of sheet brass 1-32-in. thick and about 1½ in. square was placed against the bottom of the body, marked out and cut and soldered round the outside. Fig. 1. Four small holes being drilled (shown on drawing) inside for holding down screws.

This part was laid aside and the bushes were made. A short piece of ⅜-in. dia. brass rod was chucked in the lathe, and after being faced off a ⅛-in. drill was run in for a distance of about 1¼ in. Then for about 3-16 in. in length the rod was turned down to ¼ in. dia., and then parted off, leaving a collar 3-32 in. thick and ⅞ in. dia. Two of these bushes were made. Fig. 2. The method of making the centre bush was the same, only a 5-32 in. drill was used and the bush was ½ in. dia. (Fig. 3) on flange and ⅜ in. dia. on body.

The next part to engage attention was the driver, this being made from a short piece of C. R. steel, ¾ in. dia. A 5-32 in. hole was run through for about an inch, after which it was turned down to 5-16 in. dia. for a length of ¼ in., while the flange was turned to ⅝ in. dia. by 3-32 in. thick. Two holes 3-32 in. dia. were drilled in the flange and into these were forced two short pieces of steel rod, these being soldered. Fig. 4. The complete bushes were now forced into the holes in the body and soldered inside, the flanges being outside. The shaft holes were then reamed until they were a nice running fit for the shafts.

A good point about this box is that there is no fixed centers of propeller shafts as the gears on the cross shaft can be moved in or out to suit the particular ship on which it is employed. Two gears fit on the propeller shafts, and the stern tubes should be carried far enough inside the hull to provide a bearing for these gears. Two holes should be provided in the engine flywheel to engage with the pins in the driver of the box both engine and box being screwed onto a nice block of wood. Oil holes should be drilled as shown on the drawing.

The writer hopes that these notes will be of interest to readers of "The Modelmaker," who prefer a nicely finished ship rather than a purely high-speed craft. (The three pairs of mitre gears of equal ratio ⅝ in. P. dia. can be obtained from the Pierce Model Works, Tinley Park, Ill.)

THE CHICAGO SOCIETY OF MODEL ENGINEERS

Chicago, Ill.

This Society held its Annual Business meeting on Thursday, Jan. 22, 1925, and elected the following officers for 1925:

J. A. Swanson, Chairman; Hubert Beddoes, Vice-chairman; S. C. Swanson, Secretary; C. J. Musser, Treasurer; J. Butalla, Cashier; J. Matthews, Chairman of Exhibition Committee; P. Reithmaier, Chairman of Shop Committee.

The Annual Exhibition which was to have been held last fall will probably be held in February or March, although the time and place have not yet been definitely fixed.

The Society publishes at irregular intervals the "C. S. M. E. Journal," and subscribes to the "Modelmaker" (as a semi-official organ) for all its members.

Meetings are held on the second and fourth Thursdays of each month in Room 921, Kimball Bldg., Wabash Ave., and Jackson Blvd., Chicago. Any one interested in the society or in models will find a cordial welcome there.

Further particulars will be gladly supplied by the secretary, S. C. Swanson, 7826 Coles Ave., Chicago, Ill.

Mr. F. C. Breen has kindly sent us the address of the Commodore of the St. John Model Boat Club, Mr. Harry Irvine, Telegraph and Times Office, Canterbury St., St. John, N. B., Canada. We would suggest that all of our readers, located near this city, who are interested in Model Boats should get in touch with the Commodore and ask him for full particulars of this Club. The more support these organizations get, the greater will be the interest and enthusiasm taken in Model Boat Building and Sailing.

Mr. A. A. Singer, 246 W. 12th St., New York, has made arrangements with an Engineer in England to purchase, examine and ship to him any Models and Supplies he may order. Any reader wishing to get some English model supplies should write him for particulars.

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Mr. S. C. Swanson, Sec. Chicago Society Model Engineers, writes: "It is planned to hold the Annual Exhibit of Models, Tools, etc., the latter part of March. We shall be glad to hear from those interested in our Show as Exhibitors or otherwise." Address, 7826 Coles Ave., Chicago, Ill.

Mr. Douglas Getty informs us that he would like the readers of the Modelmaker to know that he is prepared to make water tube boilers for marine stationary or locomotive purposes to order. He would like to hear from any of our readers who are in the market for Model Railway Signals. In writing him for particulars do not forget to enclose a two cent stamp for his reply.

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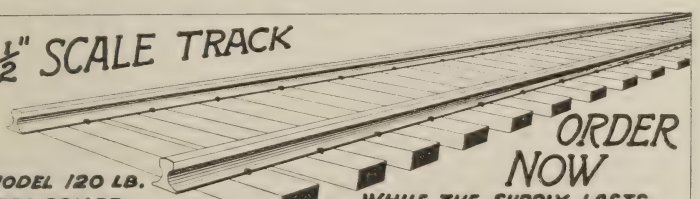

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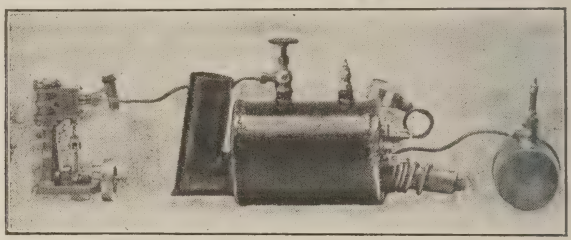

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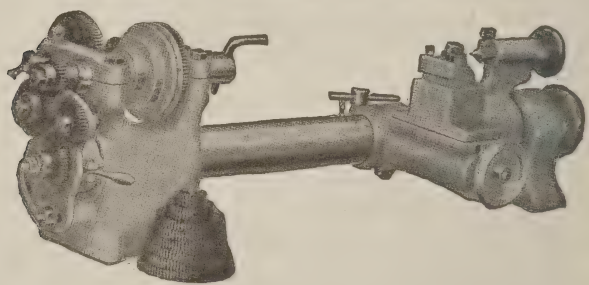

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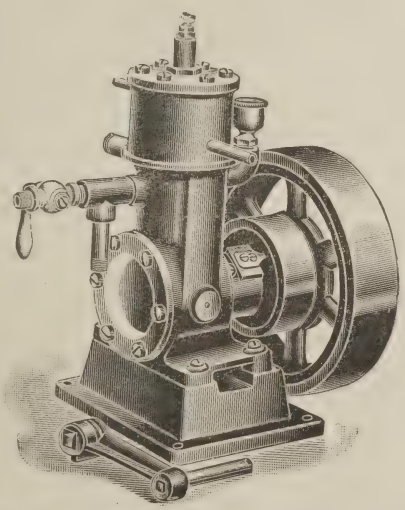

Mr. E. Hopkins 2-cycle Marine Type
Single Cylinder Gasoline Engine.

(Application Made for Entry as Second Class Matter.)

THE MODELMAKER

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OUR FOREWORD

The writer has noticed a decided tendency of late for Modelmakers to deviate from the strictly scale model of one particular type to a free lance design. It may be a composite design using the most pleasing features of several types of locomotives with the correct proportions worked out for a particular scale. The result may be a very attractive model, that functions satisfactorily, but it still lacks the individuality of a particular prototype.

The principle reason for a free lance design may be the difficulty of securing a complete set of working drawings, from which to make a set of drawings for the model to the scale required.

The amount of work entailed in scaling down a set of drawings may also be an objection. But when such sets of drawings are completed and carefully checked over there is a solid foundation to build upon without any need for any radical change during construction.

Several cases have recently come to hand where Modelmakers have made drawings for a free lance locomotive, and in each case during construction many difficulties have arisen, necessitating considerable changes, not only in the drawings but also in the patterns, and a great deal of extra work owing to parts not fitting together properly, or working efficiently. In one case the Modelmaker has been at work for two years on a locomotive, having it practically finished, only to find some of the parts would not function properly, necessitating quite some important changes and much additional labor.

A free lance design is full of openings for mistakes, alterations, or changes, as the fancy may strike the builder. Even when the work has been finished and the model found to work successfully. At best it is only a composite and not actually a miniature reproduction of some well known type.

In the Locomotive Cyclopedia will be found complete designs of modern American locomotives to scale, including tenders, valve gears, auxiliaries and all minor parts. This well known work is revised and brought up to date every few years. A Modelmaker wishing to build a model of an American locomotive will find all the necessary details in this book.

Mr. Tom Willard writes us he is starting on the construction of a model of a Lake Cruiser. Dimensions 3 ft. long 8 inches beam, 9 inches high. He will use a Model Marine Shop Co.'s Marine Engine and the fittings he has secured from The Bathe Mfg. Co.

TWO-CYCLE MARINE TYPE SINGLE CYLINDER GASOLINE ENGINE

On the first page of this issue we show an illustration of a Two-Cycle Single Cylinder Marine Type Water Cooled Gasoline Engine constructed by the late Mr. Edward Hopkins, of Freeport, L. I. The cylinder with cored ports, crank case, and main bearing were cast in one piece which was bolted to a heavy iron bed plate. In the cylinder cover a spark plug was inserted; a lug on the head of the piston tripped the spark lever to fire the charge. The timing device was attached to the inner hub of the fly wheel. It had a built up crank-shaft. The main bearing was about 3" long. Height of finished engine about 10", weight of engine when finished about 16 lbs.

A number of sets of castings of this engine were sold to different Modelmakers. One customer made some changes. He used a drop forged crank-shaft about 4" longer than the original, which gave enough space for a second fly wheel and a small circulating water pump. He also discarded the crank case cover, replacing it with a new one in two halves, having a 1" bearing for the crank-shaft. This made the engine run much steadier. The illustration shows the engine arranged to run on illuminating gas. With a carburetor specially made for this engine, Mr. Hopkins made some very successful test runs with gasoline and also with alcohol.

Mr. Hopkins also developed an improved marine type gasoline engine model much superior to the first one and built some of these as a single cylinder, two cylinder and four cylinder unit. The Executor of Mr. Hopkins' estate would like to dispose of these engines and also of the stock of cylinder castings, and parts. The single cylinder engine is fully equipped with carburetor, fuel tank, spark coil and special starting device. This would make an excellent outfit for demonstration purposes in the class room. Address all inquiries to Spon & Chamberlain, 120 Liberty St., New York.

We have just secured some copies of a Cardboard Model Locomotive L. and N. E. Ry. "Flying Scotchman" No. 4472, 1924 also "Locomotive No. 1" Stockton and Darlington Ry. 1825. Printed in colors on a sheet of card 15 in. x 20 in. with full printed instructions of how to cut them out and glue the different parts together, making two very attractive Cardboard Models.

Mr. Cecil G. Hamilton informs us he has completed the drawings and description of a plain lathe that can be made at home. He has promised to send us this article which we hope to insert in a future issue of The Modelmaker. We believe this article will interest some of our readers.

WANTED

Models, Railways and Locomotives, back nos. and Vols. in good condition. Box 10, Modelmaker.

Everyday Mechanics, Nos. 1, 2 and 6 of Vol. 1. Nos. 1, 2 and 3 of Vol. 2. Box 2, Modelmaker.

American Institute of Elec. Engrs. Volumes 1 to 8. Box 4, Modelmaker.

SOME NOTES ON CONSTRUCTION OF ½-IN. SCALE K 4 S P. R. R. LOCOMOTIVE

By H. J. COVENTRY, Assoc. Mem. A.S.M.E.

(Continued from page 28)

Back cover of steam chest is turned from solid, and bored for valve stem crosshead, two sides are then filed away to given dimensions, thus exposing the guides and giving the necessary clearance for combination lever.

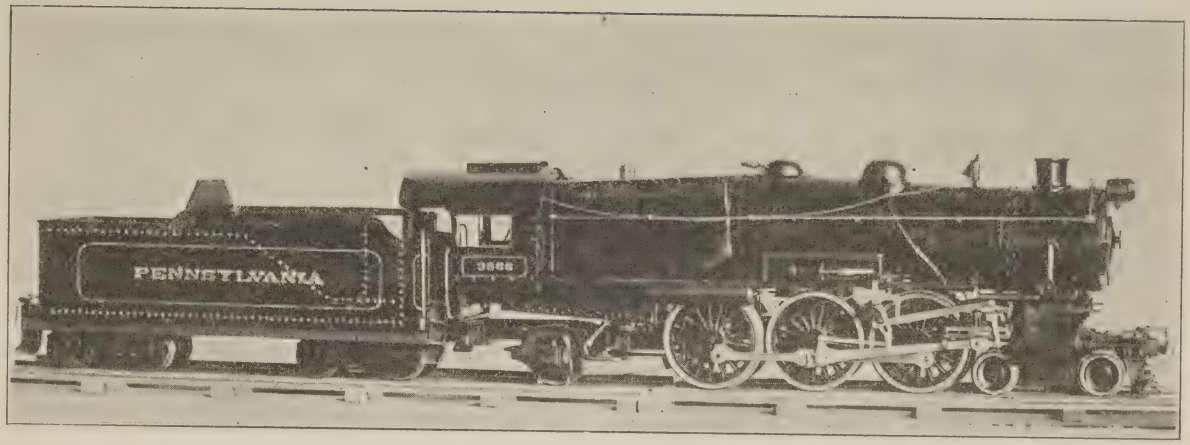
The piston should be turned and taper seat formed for rod at one sitting in lathe chuck. It is quite good practice to make the piston diameter slightly smaller than the cylinder bore, say .005 to .01", as this reduces friction, and compensates for any slight inaccuracy of alignment of guide bore and cylinder. The rings make the piston steam tight. The bull ring should be made a snug fit on piston, and the outside diameter also made slightly smaller than the cylinder.

Piston rings can be made in following manner: Take a piece of hard brass, or better still, Tobin or phosphor bronze, place in chuck and bore out to inside diameter. Take a light cutover outside and remove from chuck. Place a piece of packing of thickness equal to eccentricity of minor bore, under jaw of chuck and replace the piece. Now turn the outside 1/32" larger than cylinder bore, and part off a piece about 1¼" long. Next saw through the ring at 45°, clean up the edge with a ward file.

Now make a brass collar small enough in bore to close the piston ring bush already made. This collar should also be sawn through one side, but parallel with center. Place the collar and sleeve in chuck and turn the outside of piston ring sleeve smooth and true to a diameter of .0005 to .0007" smaller than cylinder bore. Finally part the rings off with a very narrow parting tool, taking a light feed.

For best results, the rings may be lapped on sides, but quite satisfactory working will be obtained with a smooth tool finish.

The bull ring should have the grooves wide enough to permit a nice, close fit, but at same time not so tight that the rings are gripped when the piston is mounted on rod. It is not so difficult



PENNSYLVANIA RAILROAD PASSENGER LOCOMOTIVE, K4S TYPE, ½" SCALE,
MADE BY MR. H. J. COVENTRY.

to make good piston rings as it would seem, and the results are quite satisfactory if care is taken to turn the rings accurately after being split. After drilling and tapping covers and cylinders, the joints may be made steam tight, with thin brown paper and boiled oil, or a smear of graphite and oil.

Wheels may either be held in chuck or bolted to face plate with inside or flange side of wheel nearest to tool. This will permit of bore, back face, flange and tread all being turned at one setting, and therefore true to each other. The casting should be packed out from face plate to give tool clearance.

The outside edge of tread and crank pin boss can be faced by bolting the wheel to face plate with the already faced inside edge in contact with plate.

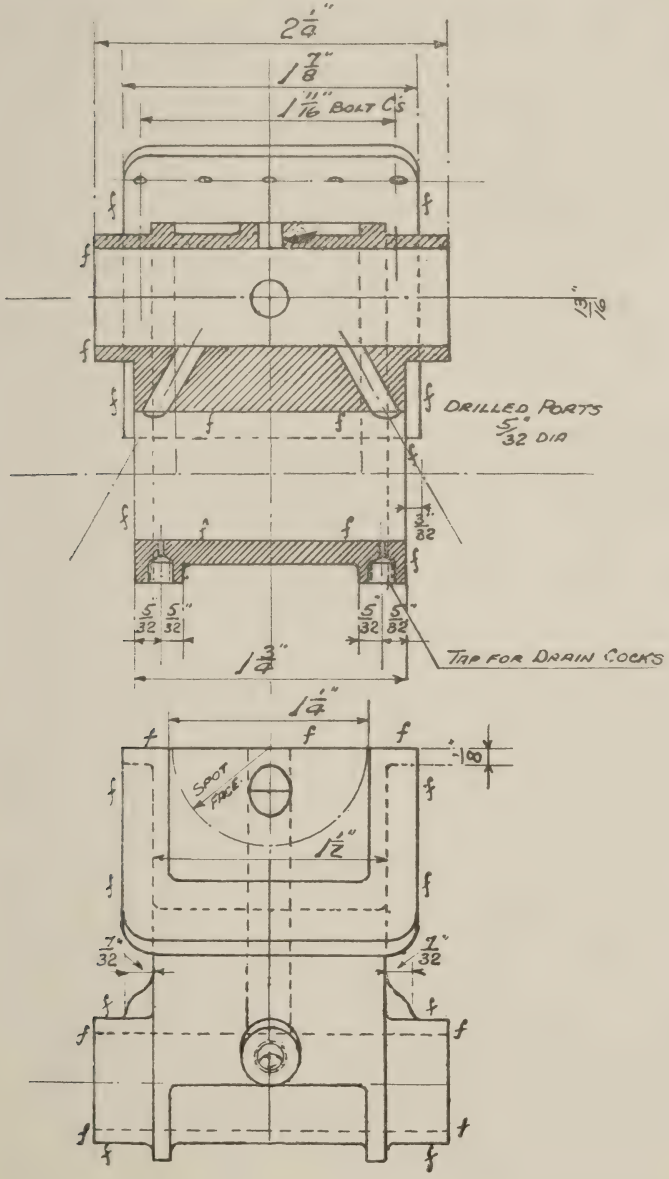
The trailer truck wheels are perhaps best chucked with outside nearest to tool and gripped by the flange. Turn the tread, face side and boss and bore. Then remove from chuck and grip by the tread, taking care that the rim seats square against chuck jaws, then face off inside and rough turn the flange.

After the wheels are mounted on axles the tread and flange can be finished turned with a "form" tool of correct tire contour, the wheels running bring lathe centers on the axles. If the chuck, face plate and lathe mandril are all true the wheels will run true, and if of correct dimension at most a mere scrape will be all that comes off with the form tool.

Axles are a simple "between centers" turning job, and need no special comment. The wheel seats should be turned quite as smooth as the bearing portion and made between .0005" and .001" larger in diameted than the wheel bore.

Frames. Two pieces of cold drawn steel bar 1½"x1¼" thick, 18½" long, will be required. After cleaning off all grease and coating with a solution of copper sulphate, the bars are ready for preliminary marking out.

First lightly scribe a line the length of the bar, which will be the engine center line, and parallel to edge of bar; then square off the centers of pedestal and mark out the portion to be removed, allowing a liberal amount for finish. Also mark off the larger pieces to be removed from smokebox and firebox ends. Now, with hacksaw and drill remove these portions. It will be found after this operation that the bar, and consequently the center line, is no longer straight, due to the removal of the internal tension stress brought about by the drawing process. The bar must therefore be bent, at the pedestal top rail, until it is as straight as can be made.


2 1/4"
1 7/8"
1 11/16" BOLT C's
13/16"
DRILLED PORTS 5/32 DIA
5/32"
5/32" 5/32"
5/32" 5/32"
1 3/4"
TAP FOR DRAIN COCKS
1 1/4"
1/8"
SPOT FACE
1 1/2"
7/32"
7/32"

It is a good practice to let the bars "season" for a few weeks at this stage, and proceed with other details of the model. Assuming this has been done, carefully file the top edge straight and square; remove the previous marking and lay out all lines and centers of screw holes from this edge as a base. The openings between pedestals are best produced by drilling a hole at each end large enough to pass the hacksaw blade and saw out the opening. The two bars may be clamped and bolted together and finished with file; also all holes drilled, after which they may be separated and front end thinned down to 3/16", and the firebox end scarfed ⅛" for auxiliary frames.

Now finish up the trailer truck bearing brackets and drill the holes. Next cut out the auxiliary frames, drill holes for footplate bracket, but do not drill the holes at end which rivets to main frames.

Having done this, clamp the bracket main frame and auxiliary frame together and drill right through, using the bracket as a jig. Finally rivet together. Brass escutcheon pins are useful as rivets, but anneal them first by making red hot, quenching in water.

The frame braces should now be taken in hand. First file the top face flat and edge of flange square with it. From these two bases all marking out can be done, using surface plate and square.

File carefully and closely to lines, checking dimensions and parallelism with calipers.

The braces may now be placed between the frames and clamped. If everything is correct, a square placed against outside of one frame should show an even bearing of blade of square upon both top rails of frame and with square stock against frame and blade through pedestal opening, should show an even bearing on other pedestal checks.

Rectify the braces to produce this result, if not already correct. Then with all quite and square drill and tap holes in braces, using the holes in frame as a jig.

Cylinders may now be mounted, and screw holes tapped; also draft casting at cab end.

Guide Yoke Casting must be filed and fitted between frames, similar to braces. The top guide bar should now fit snugly on top of front cover lug and bottom of guide yoke, while parallel to piston rod. The lug or boss of guide yoke may be scraped till the crosshead and piston rod slides smoothly and easily.

(To be continued)

MODEL TUG STEAM PLANT

By W. F. M'EWEN

This steam plant is installed in a model tug boat 30" long, 5½" beam, and 2½" draft. There is no reason why a similar plant could not be fitted to any boat about this size.

In building this plant an effort was made to keep the weight as small as possible. The plant was built with the lightest material that was easily obtained. I do not think that anyone wishing to built a similar plant will have any trouble getting most of the materials near his home. Except for the fittings, the rivets, and the silver solder everything was obtained at the local hardware stores.

The Boiler—The boiler, which is 2¼" in diameter and 8" long, is entirely of copper. The best construction would have been with seamless drawn copper tubing for the shell, but I have never been able to find any such material near my home. Since I was anxious to get the plant done, I decided to do the best that I could with materials on hand. I think that I can safely say that the results are highly satisfactory.

The shell is of sheet copper 1-64" thick, and the ends are of the same material, only a bit thicker. A piece of the thinner sheet was cut 8¼x7½". This allowed for a lap of ½" when the piece was bent to a diameter of 2¼". One-sixteenth inch holes were drilled 1" apart and ¼" from each 8¼" edge, and the surface was cleaned for ½" from each of these edges on opposite sides of the sheet. The holes for the fittings were then cut. The position of the fittings will perhaps be determined by the boat in which the boiler is to be fitted. On this one the fittings come up into the pilot house. The cleaned portions were then covered with a paste of borax and water, and the sheet bent so that the holes lined up. The riveting was next done with 1-16" round-headed copper rivets. The joint was again painted with the paste before it was riveted. A strip of tin was used to place the rivets in the holes. Two cuts in the end of this strip held the head of the rivet. After everything was cleaned again, the silver soldering was done. The tube was filled with charcoal and banked with more of the same. The shell was placed with the lap up, and the solder put in this. The joint and the bushings for the fittings were soldered at the same time. To round out the shell I rubbed it around a scrap piece of 1½" round wood.

The ends were next fitted. These were cut to fit inside the shell. I see no reason why the ends of shell could not have been squared and the ends cut large and silver soldered on. At the same time that the ends were cut the stay was fitted. In this boiler it is a length of 3-16″ copper tubing, the nuts being of scrap brass. This material was used because it was the only stuff I had that was suitable. At the same time the water gauge was prepared and fitted. Then the ends, the stay, the water gauge, and the bushing for the check valve were silver soldered. After the soldering the ends of the shell were turned over.

The fittings having been put on, I tested the boiler to 100 lbs. water pressure to the sq. in. The safety valve lifts at 30 lbs. per sq. in. I might add that the water pressure took out the few remaining dents and bulged the ends a bit.

I tried to make the boiler tight without soft solder, but I was not sucessful. If I had succeeded I would have had a boiler not easily damaged by low water with alcohol firing.

Fittings—The boiler has a safety valve, steam valve, water gauge, pressure gauge, and check valve. The pump is not on the boat, but it is connected with a rubber tube when needed.

I purchased the valves and found the steam and check valves rather heavy. These were lightened with the hack saw and files. Care must be taken in such work not to damage the threads, or the valve may leak. A water gauge was ordered, but this was so heavy and big that I could not use it. I made the one on the boiler and find it very satisfactory.

A "solderless" fitting such as is used on automobile gasoline lines was obtained. Any fitting that has two unions can be used for a gauge. This was drilled through with a 5-16″ drill and cut as is shown. The pieces are soldered to the bent tubing on the boiler. This tubing is 5-16″ copper and is filled with lead and bent. The nuts on the fitting were cut down. The glass is packed with pieces of thick-walled rubber tubing. Three-sixteenth inch glass is used. This glass fits the holes in the nuts and packing rubber tube very nicely. The nuts are no tighter than is necessary for water tightness. If it is desired a cock can be fitted for blowing down the glass.

Casing—The casing is of sheet tin. It is in two pieces so arranged that the top can be lifted off. This is to get at the boiler for cleaning. There is soot formed on these boilers, and it is hardly possible that this soot helps the steaming. In fact, I have heard that it is a better heat insulator than asbestos. The ends of the casing are fastened to the top section and lift with it.

These ends may be cut to reach to the side of the boat and thus hold the boiler in position. The casing is set on a sheet of asbestos and lined with the same material. There is a slot cut in the top to clear the steam and safety valves. A piece is cut that is put on from the side to cover this slot. It is held in place by the spring of the casing that pushes it against the steam pipe union nut. This piece is shown in the sketch. The stack is of shim brass, riveted, and the exhaust is turned up the same.

The air holes are punched with a drive pin punch. The work is put on the end of a block of wood. A few blows of the hammer and the hole is through better than it can be drilled.

The boiler is supported by two bands of tin. It is held up by wire passed under the boiler and through holes in these bands. The strips are fastened to the bottom of the casing with Meccano nuts and bolts.

The Engine—The engine is a single cylinder, double acting, slide valve upright marine engine. The bore and stroke are ⅝x⅝". I suppose that this engine is rather large for this boat, but I had it on hand. If it is desired, and one has a lathe, the cylinder could be fitted with a liner. On the other hand, the model is a tug, and tugs have powerful engines, so I think the engine is not too big after all.

This engine came from a New York City company, and is an excellent little piece of machinery, but it was too heavy for the boat. I lightened it considerably without weakening it enough to make it unfitted for the task of driving a model tug. The steam pipe originally entered the valve chest cover, and since the engine is behind the boiler a bend would be necssary in the steam line. An elbow union was fitted to the side of the steam chest, and a new cover was made. This arrangement brings the steam from the boiler direct to the engine. I have lagged the cylinder with wood, held on by two pieces of watch spring. I think this greatly improves the appearance of the engine. A displacement lubricator has been fitted.

Burner—Since it was necessary to keep the weight as low in the boat as possible, the boiler was placed low. This made a tray burner necessary. This type of burner is not always satisfactory, especially when there is much fuel in it, as this often boils and runs over. However, this type of burner has been installed in the boat and has proved successful, due to the feeding arrangement.

(To be continued)

DETROIT MODEL YACHT CLUB

Model Power-Boat Rating and Racing Rules

(Continued from page 22)

RACING RULES

Section I. All boats must carry private signal number on both sides of boat, about five inches from stern and midway between waterline and sheer.

Section II. All races to be run in three heats.

Section III. Only one entry per member for any race.

Section IV. There are to be a maximum of: five laps for classes 1 and 2, and eight laps for class 3, per heat, for which points will be given.

Section V. All laps to run consecutively, timing to begin after flying start of one lap; starting lap not to be considered as part of heat. Boats must not be touched after starting.

Section VI. The winner of the heat shall be determined by the point system, whereby each boat starting and finishing a heat will receive as many points as is indicated in the following table: First boat to finish 400 points; Second boat to finish 361 points; Third boat to finish 324 points; Fourth boat to finish 289 points; Fifth boat to finish 256 points; Sixth boat to finish 225 points; Seventh boat to finish 196 points; Eighth boat to finish 189 points; Ninth boat to finish 144 points; Tenth boat to finish 121 points; Eleventh boat to finish 100 points; Twelfth boat to finish 81 points; Thirteenth boat to finish 64 points; Fourteenth boat to finish 49 points; Fifteenth boat to finish 36 points; Sixteenth boat to finish 25 points; Seventeenth boat to finish 16 points; Eighteenth boat to finish 9 points; Nineteenth boat to finish 4 points; Twentieth and after 1 point.

Should a boat fail to finish a heat, it will be awarded points according to the following: For every lap it fails to complete it will be awarded a position that many places lower than the last boat to complete the course. For example, to determine points for a boat completing three laps only, the last boat to finish being awarded ninth place, the boat having two more laps to complete would be awarded points corresponding to finishing in eleventh place. (100).

Section VII. Should two or more boats have scored the same number of points for the series, thus establishing a tie, the tied boats are to receive one point extra for every heat they finished

first in. Should this fail to decide the winner of the race, that boat (which is tied after the foregoing points have been awarded) having the least total elapsed time for the entire series shall be declared the winner.

Section VIII. All boats are to be allowed three starts.

Section IX. Each lap is to be timed as well as total time of heat.

Section X. All races are to be run on a tethered circular course. Diameter of course to be not less than 100 feet. Height of cord at tether pole, to be not less than 2 feet 6 inches nor more than 4 feet from water, the line to be kept reasonably taut at all times.

Section XI. The power plant of boat must be self contained.

Section XII. Any boiler, engine, or any other part of power plant, (whether steam or internal combustion) which the committee decides is of unsound construction, or any use of same which would render them unsafe to be barred from use in races or otherwise.

Section XIII. The races shall be in charge of the racing committee, whose decisions shall be final where any breach of the racing rules or conduct of races are concerned.

(Signed) HERBERT C. FIELD,
Secretary.

Rating and racing rules as amended Dec. 4th, 1924.

One of the coming subjects that we think will interest many of our readers is Gliding Flight. Some years ago Mr. A. P. Morgan built several 20 ft. Bi-Plane Gliders in which he made a number of successful flights, but the great War interfered with the development of this work. In his book "How to Build a Glider" he gives full description of the construction and detail drawings. Many copies of this book have already been sold and a number of machines were constructed from material obtained from the Author. Some time ago he discontinued supplying this material. One of our customers, Mr. Icken, of Morsemere, New Jersey, has taken up this proposition and will shortly be able to supply all the necessary parts.

There has been quite some controversy over the relative values of liquid fuel burners V. solid fuel for Model Locomotives. Some Modelmakers prefer the blow torch because they claim it enables them to get up steam quicker and maintain a more constant pressure. The main fault of this system seems to be the waste of steam and fuel when the Locomotive is at rest. Solid fuel has its advantages. With the blower, a full head of steam can be maintained while the engine is in operation, and when at rest the blower can be shut off, thus reducing the heat and conserving the steam. We would like to receive comments on this subject from our readers.

BOOK REVIEWS

Motors in a Nutshell, by Capt. S. Bramley-Moore, 6th edition, revised, 358 pages, illus., 6¼ x 4 in., limp cloth, $1.00.

A plain description of the Modern Chassis, with illustrations and diagrams of the engine, carburetor, magneto, and transmission, together with a section on roadside troubles with 200 questions answered.

The Model Railway Handbook, by W. J. Bassett-Lowke, 7th edition, revised and enlarged, 132 pages, 205 illus., 9 x 6 in., boards, $1.00.

A practical guide to the purchase and installation of the equipment of a Model Railway. A work that will prove of value to every one of our readers interested in this branch of modelmaking.

Motor and Carriage Painting, by A. Bates, 2nd edition, revised and much enlarged, 210 pages, with 4 pages of monograms, 8½ x 5½ in., cloth, $2.50.

The Author has made a specialty of this class of painting for many years. Not only has he the practical experience but he has the facility of imparting his knowledge in a plain straightforward way that any practical man can fully understand. It is unquestionably a practical manual.

Scumbling and Color Glazing, by A. Miller, 2nd edition, mostly rewritten and considerably enlarged, 91 pages, with 13 page plates of color samples, 8½ x 5½ in., cloth, $2.50.

A practical handbook for house painters, coach painters and others. Most of the color samples are quite new and include a number of examples of brush graining which is now so largely in use. The practical man will find much valuable information within the covers of this book.

Electric Circuits and Installation Diagrams, by W. S. Ibbetson VII; 190 pages, 177 illus., 8¾ x 5¾ in., cloth.

This work is specially intended for men engaged in the operation and control of all kinds of power and lighting plants and installation work generally. While it is impossible to give illustrations of every form of circuit the underlying principles have been fully illustrated.

COMMUNICATIONS

The Editor The Modelmaker

Dear Sir:

Today I received my first issue of The Modelmaker and I like it very well.

Some time ago I received a letter from Mr. Truitt of San Francisco, stating that he wished to exchange photographs and specifications of our models, which we did.

This gave me the idea that, why couldn't we, the Modelmakers throughout the country, exchange photographs and specifications of our models to put in a permanent portfolio?

In order to make the portfolio a very fine one, which every Modelmaker would be proud to possess, I suggest the photos be about five by seven inches and that the specifications sheet be of the same size as the photo and typewritten in neat form and containing the following information: The name and address of the maker, the type or name of the model, the scale, time required to build and general data of the model.

I would like to receive suggestions from those interested.

G. A. DIEHL, 1303 W. Dean Ave., Spokane, Wash.

We have just received Catalogue No. 84 describing the famous South Bend Lathes. Metal working, screw cutting engine lathes. This catalogue will certainly interest many of our readers and especially those who are instructors and teachers in manual training schools. The workmanship and finish of the machinery produced by this firm is of the very highest standard. If you are in the market for a good lathe or lathe attachments, we would suggest you send them a request for a copy of this Catalogue No. 84.

Mr. Douglas Getty is preparing a printed list of his Locomotives and Castings and will send a copy to anyone interested on receipt of 2 cents.

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Blue Prints of Ships for Modelmakers, send for circular. G. B. Douglas, 165 Summit Ave., Upper Montclair, N. J.

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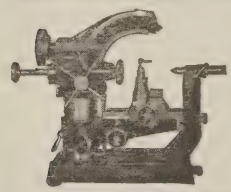

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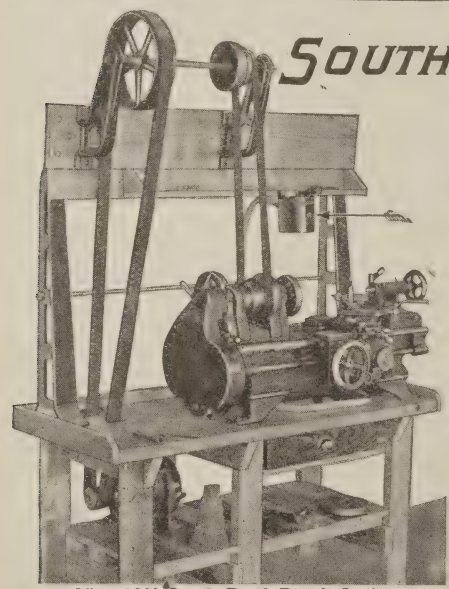

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Vol. II., No. 4 April, 1925 10 Cents

MR. ARTHUR W. LINE'S
MODEL 2-4-4-2 110-VOLT ELECTRIC LOCOMOTIVE
1¾" Gauge, ¾" Scale

(Application Made for Entry as Second Class Matter.)

THE MODELMAKER

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OUR FOREWORD

It has been said that the inhabitants of the United States are not sea fearing people. This might be true as regards the inland portion of our population but this statement does not apply to every part of the United States. Take for instance the New England States where at one time Shipbuilding was a flourishing industry producing many famous Clippers, Schooners, Fishing Boats and Walers, not forgetting "Cup Defenders." In the high day of our Maratine Power the Yankee Skipper and his Clipper was a familiar sight in most important ports of the World.

Many of the men of these Seaport Towns were deep sea men and they loved the beautiful ships they helped to build and man. It was quite natural then for numbers of these old timers to seek to perpetuate the memory of some particular Vessel by the construction of a Model in their leisure time. Faithfully reproducing in miniature every detail of ship, spars, rigging, sails, gear and fittings.

The Peabody Museum in , Mass has quite a collection of these Models as well as paintings and engravings. Sad reminder of the passing out of these fine timber Vessels.

Considerable interest has lately been manifested in the construction of ship models, especially of Vessels that were famous in their day, but have long since passed out; some to Davy Jones and others to the scrap heap, leaving nothing to the lover of the Sea and its ships but a glorious memory.

Several most interesting books have been published on the subject in the past three years. We have just received a prospectus of a new book on Ship Rigging that will be issued shortly.

We shall be glad to hear from any of our readers who have built or are building ship models.

Mr. Lyles Z. Nelson of New Baltimore, N. Y., has a preference for ship models. He has built five Model Steamers. Three of them copies of ocean going vessels, one of these being a model of the S. S. White Star Line "Majestic." The other's are models of two Hudson River Steamers, the S. S. "Berkshire" and the "Robert Fulton." He uses the bread and butter system of built up hulls. Lack of space in this issue prevents us giving fuller details but we hope to give some more particulars about this gentleman's models.

MODEL 110-VOLT ELECTRIC LOCOMOTIVE

2-4-4-2, 1¾ GAUGE.

By ARTHUR W. LINE

In response to several requests there is here presented a brief description of the writer's 1¾ in. gauge electric locomotive which has been on exhibit, together with a 10-car freight train, at the Grand Central Terminal, New York, for the past year.

The locomotive was first built twelve years ago but has been rebuilt and overhauled, painted and lettered several times. Space will not permit an account of the various changes in design and the improvements which have been made. Suffice it to say that of the original form only the axles, main axle boxes and frames, the motor and some of the gear wheels remain. The cab, roof, equalizing gear and pony trucks have been entirely rebuilt, the gear ratio changed and all wheels renewed. The locomotive was originally built to carefully designed drawings but all changes were made to detail drawings and no drawings have been made as it exists today.

The model is built to 1¾ inch gauge, ⅜ inch scale clearance limits and is of free-lance design though molded somewhat on the lines of the Boston & Maine Railroad 5000 class electric locomotives operating through the Hoosac Tunnel. The truck frames and crossties are cut from hard sheet brass and the main axle boxes are white metal castings. The driving wheels are turned from hard close-grained cast iron and the pony wheels are turned from mild steel bar. The pony truck frames are of hard sheet brass, the axle boxes are brass castings and the wood bumper beam is attached directly to the pony truck frame instead of to the main truck frames on account of the sharp curvature. The pony truck also carries the couplers and safety chains, the footboards and flag sockets. All flanges are of scale width and slightly over scale depth. The helical springs shown on main trucks are too stiff to function and are considered as dummies, but perfect flexibility is provided by equalizers which are pivoted under concealed knife edges at their centers. The pony trucks have no springs on axle boxes nor any guiding springs, but a portion of the weight of the cab and main frames is transmitted to them

through centrally located leaf springs, thus giving great flexibility. The locomotive has excellent riding qualities and although the flanges are very small for this guage track derailments were very infrequent even over rough track on curves and at high speed.

The cab is made of heavy tinned sheet iron applied to a bar frame, but the writer would never use this material again on account of the lack of the necessary stiffness also difficulties with rust. Hard sheet brass is the best material for metal cabs.

The driving wheels are 1 5-16 in. and the pony wheels are ⅞ in. diameter. The wheel bases are: pony to front driver, 2 in.; between drivers, 2¼ in.; pony to second driver, 4¼ in.; total wheel base, 11 in.

Power is derived from a single Westinghouse 8-inch-fan motor wound to run on 50-cycle current but it also operates on 25 and 60 cycles and on direct current. On 60-cycle current the power is slightly less, but on 25 cycles the power is considerably more, while on direct current a great increase of power is obtained.

The motor is mounted above the frame of one truck and occupies one end of the cab, the remainder of the cab containing 3-speed rheostat, reverser and wiring for the motor, headlights, cab-light, also four corner lights used as classification or tail lights as required. The motor shaft is at right angles to the axles and drives a countershaft through 4 to 1 ratio, 32 pitch bronze bevel gears. This shaft, in turn, is connected to the second driving axle through a 2 to 1 ratio ladder chain reduction gearing, the countershaft carrying a 10-tooth sprocket and the driving axle having a 20-tooth sprocket. Each driving axle carries a 32-pitch 36-tooth bronze gear and the two axles are connected through a similar gear on an intermediate jack-shaft between the wheels and inside the truck frames. The gear ratio of motor shaft to driving axle is 8 to 1. The other truck, while provided with current collectors, is at present only a carrying truck, but later on will be geared to the motor in order to give more adhesion.

The current collectors, four in number, are of the third-rail over-running type. In the center of each side frame is mounted a metal-faced fibre insulating block. The collector gear is attached to these blocks, the brackets being milled and filed from solid steel. The holes for the attaching screws are slotted to allow for vertical adjustment of the shoes to exact level of the third rail. A coiled spring on the hinge pin presses the shoes down on the conductor rail. When not in use and folded back the shoes

are kept up by a catch made of watch spring. The shoes are of steel to resist shock and wear, and the whole collector gear is modeled after those in general use. A pantagraph collector will be added later on.

To use a steam phrase the locomotive is "over cylindered" and requires more drivers and more weight to fully develop all its power. Enough cars to load it to full capacity were never available, but 12 8-wheel cars loaded to represent 20 cars is a fair load with the present four drivers. With eight wheels geared to the motor and using direct current the estimated load is about forty cars.

Lack of space prevents mention of further details, but interested readers are referred to American Modelmakers' News-letter No. 20 appearing in Everyday Science and Models of October, 1922, where views of the top of the locomotive and the trucks are shown, and results of electrical and hauling tests are given.

The writer has derived a tremendous amount of pleasure in planning, building and improving, in painting and lettering, testing and operating this locomotive. Future plans, however, call for locomotives of the coupling-rod types as being much more interesting to build and much more life-like in action. To anyone interested the following three examples of side-rod electric locomotives are recommended for modelling: Norfolk & Western Railway, 2-4-4-2 locomotives, operated in pairs, of the first design; Pennsylvania Railroad System, Class FF-1 articulated 2-6-6-2 locomotive; also Class L-5 non-articulated 2-4-4-2 locomotive. Drawings and illustrations of these and other locomotives have been published in the railway press from time to time and may be found in the fifty odd pages of the electric locomotive section of the Locomotive Cyclopedia, the 1925 edition of which has just been issued. A very good book on the subject is "Railroad Electrification and the Electric Locomotive" by Arthur J. Manson, 1925 edition. These two books are the very last word on the subject of heavy electric traction. The modelling of electric locomotives and railways is very comprehensively treated in Henry Greenly's splendid book "Model Electric Locomotives and Railways.' These three books are heartily recommended to serious electric railway modellers and students and will prove to be of real and practical value in overcoming every difficulty encountered in building model electric locomotives and railways.

MODEL TUG STEAM PLANT

By W. F. M'EWEN

(Continued from page 43)

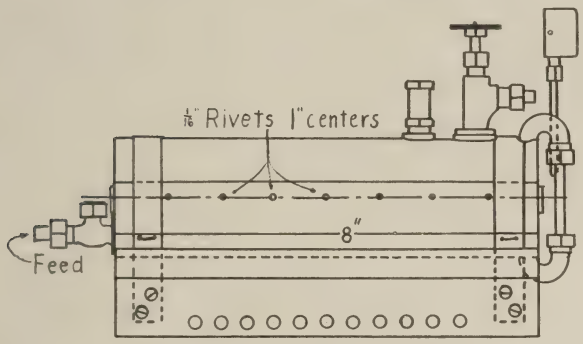
The burner is of sheet copper and is silver soldered. The tray is filled with small pieces of unraveled asbestos rope. However, cotton or waste could be used, but will require frequent replacement. If weight is very important, the tray can be made of shim brass. If this is done care must be taken not to burn the metal when silver soldering. The alcohol is led to the burner by ¼" copper tubing. This size is used to lessen the capillary attraction. The fuel is distributed throughout the burner by the tube, which has saw cuts along the lower side. The fuel pipe can be cut off short inside the burner, and an inverted trough of shim brass with cuts along the sides used to carry the fuel. This arrangement is perhaps the better of he two, because it is lighter, and also the copper tube will not heat up as much as it does when it runs through the burner. The tray must be inclined a bit so that the alcohol will run from the tube to the other end.

The fuel is supplied from a tank. The rate of feed is regulated by a small auxiliary tank. This tank contains two compartments. The fuel is supplied to one from the main tank by the "chicken feed" scheme, and then is carried to the other compartment by the wick siphon. Reference to the drawing will make this clear. From the second compartment the alcohol is led to the burner.

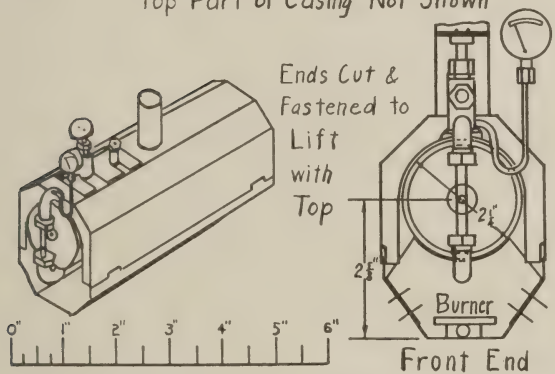
The two tanks are made of shim brass to keep the weight down. This material lends itself to model boat work very nicely. The upper tank must be air tight. It is filled through the tube in the bottom, the tank being turned upside down, and a small funnel being used. The number of strands of yarn can best be determined by trial. It is best to begin with one strand and work up rather than begin with several and work down. The position of the tanks will be determined by the boat. In my tug a holder for both tanks is soldered to the stern tube. This holder is simply a bent strip of sheet metal.

A joint can be put between the tank and the burner. This joint can be made of an internally threaded piece of 5-16" tubing screwing over the ends of the ¼" tubing.

Boiler for 30" Model Boat

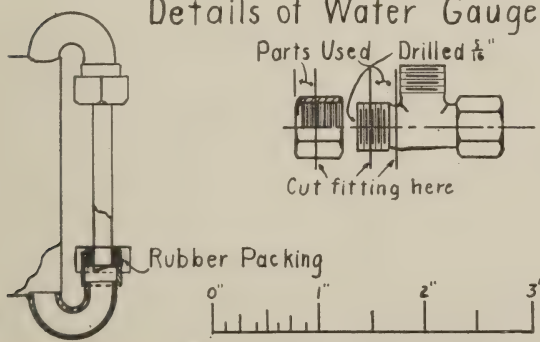


Elevation of Boiler
Top Part of Casing Not Shown



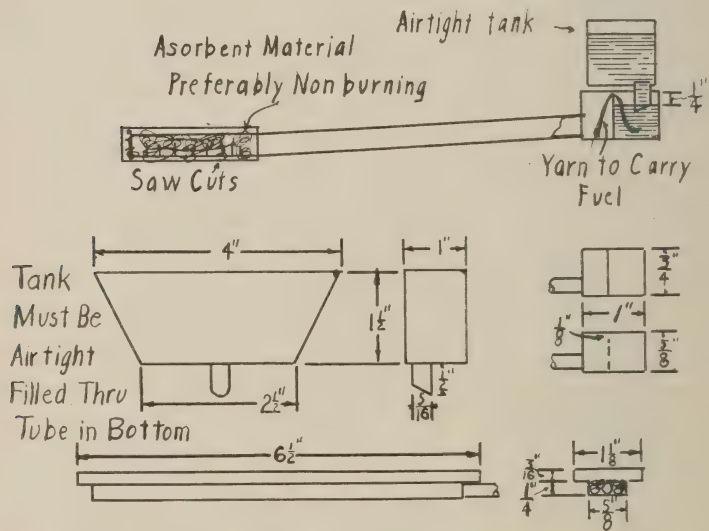
Front End

Details of Water Gauge



The burner was started by filling the tank and placing it in position so that the tube came down into the small tank. A few seconds were allowed for the fuel to reach the burner before it was lighted. The wick works much better if it is wet before the tank is placed in position.

This tray type of burner is said not to be extremely efficient, but in a boat of this size the amount of alcohol burned is so small that the cost of operation is not excessive.



Weight—The complete boiler weighs 1½ lbs. empty, and holds ¾ lb. of water. The burner weighs ¼ lb. and holds ¼ lb. of alcohol. The engine has been cut down to weigh 1½ lbs. The boiler steams for about half an hour on one filling.

Some weight might be saved if thinner material than the tin was used for the casing. Also it is possible that a lighter engine could be used, or this one cut down still more.

Mr. G. B. Douglas informs us he has just completed His M. S. S. on the construction and rigging of ship models which he hopes to have in the press in the near future.

SOME NOTES ON CONSTRUCTION OF ½-IN. SCALE K 4 S P. R. R. LOCOMOTIVE

By H. J. COVENTRY, Assoc. Mem. A.S.M.E.

(Continued from page 40)

Bearings are cut from solid bar brass. First cut out a square piece and fit in another piece of brass, to eventually form the oil cellar. Sweat the two pieces together and drill out the bearing on the line of joint. File away the side to form the flange and to fit nicely in pedestal of frames. Drill and tap for screws holding cellars in place, and finally heat bearing to melt the solder clean off and drill a pocket in cellar for lubricating pad.

Side Rods are to be cut from cold rolled steel and brass bushes pressed in.

Valve Gear. Expansion link must be carefully lined out, slot drilled and filed out. (A jeweler's saw is very useful for such work.) The best method, of course, is to mill the slot, with an end mill, while the job points over the radius of center line. With care, however, a filed slot will give quite good results.

The gear brackets which are attached to motion beam should be cut from a solid piece of steel; all drilling done while solid. Now the bracket is to be set up on motion beam, and both holes drilled in beam using the bracket as a jig.

The bolts should be a close fit; after the bolts are fitted the brackets must be sawn between the bolt holes, thus giving two brackets, and enabling the assembly of gear.

A similar scheme is adopted in making the expansion link trunnions by turning the trunnions from solid, milling out for link riveting to same, and then filing away the surplus metal.

The eccentric rods, reverse lever arms, screw reverse gear, etc., need no special comment.

Engine truck is built up of side frame castings, bolster and center plate, side play being controlled by two spiral springs placed between bolster and side frame.

Trailer truck consists of one casting, end of which pivots in a fram brace, front of firebox; the weight of main frames being carried by a pad piece bearing on frame sides. The reaction is

taken through a hanger, end of which is carried in a single-leaf spring, screwed to main frames. The axle boxes should be provided with spiral springs concealed in a counterbore.

This practically completes the engine proper, and the boiler may be undertaken.

The barrel consists of a piece of seamless drawn copper tube 3¼" outside diameter 14 G. B. & S. Square up the ends and make exactly 12" long by plugging ends with wood blocks, turned to fit inside of tubes. Mount between lathe centers and face end while in lathe; the pitch line of rivet may be scribed by placing a scriber in tool post.

The back head which is a casting should be filed up over flanges and firedoor fitted; also throttle rod stuffing box fitted.

Bore out throat plate to a nice fit on barrel and scribe line for rivets before removing from lathe; also file flanges clean and drill holes in bottom, as shown on drawing.

Turn and face tube plate, drill holes for flue tubes, and fit superheater header. To make the joint between header and steam pipe from boiler, a small ring is ground to a steam-tight joint on one side, to tube plate and other side to header. By this means the steam pipe need not be fixed in tube plate, as the ring is drilled same diameter as outside of steampipe.

Firebox is made of two flanged plates of 22 G. B. and S. copper, and a wrapper plate of same material. The firebox tube plate should be reinforced with a liner say 1/16" thick on fire side of sheets. The liner may be timed all over one side, and sweated to plate, and is for the purpose of giving a reasonable number of threads for flue tubes. The tube holes must be drilled and tapped after this operation. The flanging of plates may be done on hard wood formers, gradually and evenly working the flange over with a hammer. The plates will have to be annealed two or three times in the operation by making red hot and quenching in water.

Mud ring may now be cleaned up and tinned on inner and outer sides.

The firebox wrapper plate should be rivetted to the flanged plates, first tinning all joints; also mud ring should be held in position by soldering in a few places.

The outer wrapper plate should be cut to a paper template and all stay and rivet holes can be drilled before bending to shape. The reinforcing liners for safety valve may be rivetted on after bending; but leave the drilling and tapping for boiler fittings till after boiler is tested.

(To be continued)

MODEL SHIPBUILDING NOTES

The Construction of Sheet Metal Hulls

By CECIL G. HAMILTON

In a previous issue of "The Modelmaker" the writer gave a brief account of the methods employed to construct a speed boat hull, by cutting it out of a block of pine. In this article it is proposed to give the methods employed by the writer in the construction of some of his most successful model ships. Indeed, for the last few years, the writer has not used any wood in the finished model where it was possible to use metal.

It is assumed that the builder understands the use of the soldering "copper," and the various kinds of solder; then as a start, we will take a hull of ordinary form, such as a tug-boat, and go through the different stages. Upon looking over our "lines," we find the hull measures three feet four o.a. and eight inches beam, with the sections spaced four inches apart, beginning from the bow. This will give us nine sections. A piece of good pine is procured, and planed up to finish four feet long and ten inches broad, and one inch thick. Down the center of this board draw a straight line, and at right angles to this line draw as many lines across as there are sections in the body plan, numbering them 1, 2, 3, etc., as fig. 1. Now from the body plan transfer the deck half breadths to the board, and through the spots thus obtained, with a thin batter of ash ⅛ in. by ⅛ in. and five feet long, draw in the deck line on both sides of the centre line, fig. 1 showing the job thus far, also showing how the half-bredths are transferred.

Leaving this part aside for a time, we must now obtain some thin cardboard, and with the aid of a piece of carbon paper a half section must be traced on to the cardboard, thus giving us nine half-sections, same as the body plan. All lines must now be checked up, and if they are all right and at right angles the cardboard should now be cut out carefully as in Fig. 2.

The next requirement is some nice pine boards ⅜ in. thick and about nine inches square, and down the center (in the direction of the grain) draw a line. At right angles to this line, draw across the Deck and L. W. L. (Load water line) lines. The cardboard half section is placed with all lines correct on the wood, and the section drawn in on both sides of the centre line, and we now have a full section on the wood.

These pieces of wood now being called "Moulds," fig. 3. At this point we may pause, and have another look at the "lines," and we find that the deck has a sheer, that is it is higher at the bow and stern than amidship, so on the sheer plan let us draw a line about two inches above the deck at the Mid-section and parallel to the L. W. L., this line representing the surface of our 1 in. board. On the moulds mark the distance from the deck to the base line and at this line our moulds are cut. At each side of the moulds below the deck line mark out a notch ⅜ in. by ⅜in., this to receive the Gunwale. Each mould will now be ready for cutting out, and care must be taken so that they are correct. Fig. 3 shows the mould ready for cutting.

All moulds must now be checked up with the drawings, and on finding them correct we will now prepare the gunwale. For this we must obtain some nice straight grained ash or elm ⅜ in. by ⅜ in. and about five feet long, getting it smooth. Two pieces will be required. Now take the moulds and glue them on to the board, and when the glue is set, the gunwale pieces must be fixed into the notch in the midship mould and a thin nail driven in at this point; fig. 8 gives the idea allright. It must be noted here that all moulds forward of the midship mould are placed with their thickness in front of the line on the board and all those aft are placed aft of the line, fig. 4, the reason for this being that the edges have to come off some of the moulds, so that the plating will lie flat.

Now grasp the gunwale pieces at the bow and press them together, at the same time forcing them into the notches in each mould; when they are in tie the gunwales together at the bow, then drive a nail in at each mould. Cut the gunwale pieces off at the bow till they come to a point, and cut out a little piece of wood ⅜ in. thick and fit it in between and nail it and it should then look like fig. 5. The after end is done in the same way.

We must now fit the stern and sternpost. For the stern get a piece of brass ⅛ in. thick and 5-16 in. broad, and bend it the shape of the bow shown in sheer plan, cutting a notch out of No. 1 mould at the keel and out of the bow piece, fig. 5. For the sternpost two pieces of brass are required, 1-16 in. thick and 5-16 in. broad, these are left straight; but at the centre line of shaft they are dented, thus leaving a hole for the stern tube to pass through. They are then riveted together, fig. 6.

We must now take our batten, and bend it round the moulds, and we find that some of the moulds will require the corners pared

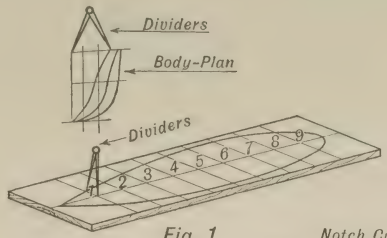


Fig. 1

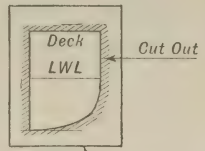


Fig. 2

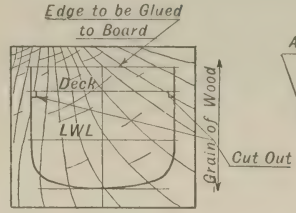


Fig. 3

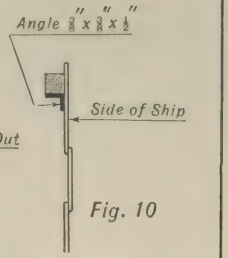


Fig. 10

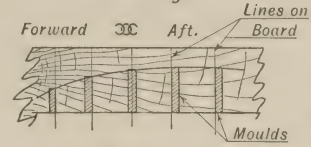


Fig. 4

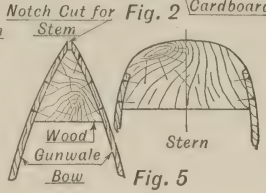


Fig. 5

Fig. 6

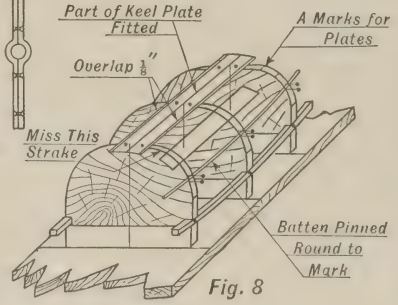


Fig. 8

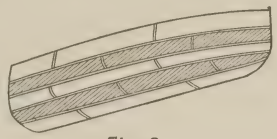


Fig. 9

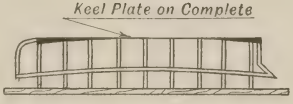


Fig. 7

off; after doing this the mould is complete and ready for the "shell," fig. 7. The midship mould would now be divided into an equal number of parts, say 6 (that is from keel to deck), and with the batten at this point, pinned, it should be bent round all the moulds and each one marked (as at A in fig. 8).

For the "shell," the best material to use would be hard drawn sheet brass about 28 B-S gauge and taking the keel first; a piece must be cut 12 in. long and the bredth of both sections are on each side of centre line plus ⅛ in. on each side for overlap. Two pin holes are drilled opposite each mould and the plate is pinned to the mould. This first plate should be right amidships (see fig. 8). The other two keel plates are each 14 in. long, one at the fore end and one at the after end, and the keel plate is complete. Now miss a "strake" and fit on the next "strake," and when this is done, we have three "strakes" complete from bow to stern, on each side. These three are called "in strakes" and then the closing strakes are fitted, with an ⅛ in. lap. The laps running fore and aft are called the seams and laps running crosswise are called "butts."

For the closing plates, paper patterns will have to be cut, marking them along the "in strakes," and allowing the ⅛ in. With all joints clean and a good fit the "butts" must be soldered first, then the seams, care being taken that there are no holes left. Fig 9 shows the forward half complete. Having soldered the hull, first remove the hull and moulds from the board, then pull out the pins and remove the moulds and gunwale, finally soldering up the pin holes in the shell. The shell should project above the gunwale about ⅛ in. to allow for fitting the deck. Carefully remove the gunwale from the moulds and, having fitted some little angles ⅜in. by ⅜in. by ½ in. long inside the shell ½ in. below the top, the gunwales are fixed in the hull again and made fast to these angles, fig. 10.

The heavers for carrying the power plant will depend on the kind of machinery used, and should anyone care to use this method the writer will be pleased to assist with suggestions regarding the bearers. Some metal may be spoiled before the builder gets the correct shape; however, with a little patience, good results can be obtained. Many more parts of models can be made easier with metal, such as deck houses, casings, funnels, etc., and later it is hoped to describe such work, also details of different ship fittings.

Mr. Mercier, a member of the Hackensack, N. J., Fire Department has been making models for some years, specializing in fire apparatus. One of his best efforts is a splendid model of a Hook and Ladder with its usual equipment including a set of seven ladders. He has also built quite an elaborate dolls house fully furnished. He is now actively engaged in the construction of a model of a hose cart which he hopes to make his very best example of model work.

If any of our readers should happen to be near the Hackensack Fire Station, we would suggest they drop in and see Mr. Mercier. He is always glad to show his models to anyone interested.

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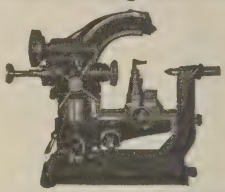

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OUR FOREWORD

For the successful development of American Modelmaking the spirit of cooperation is essential.

First—Cooperation between the Modelmaker and the Manufacturer of the necessary supplies. The Modelmaker desires to purchase his castings and other necessary materials as near home as possible. He wants good castings of well designed, up-to-date American types or finished models of good workmanship. He wants fittings, accessories and parts at reasonable prices, prompt service and that they be properly packed for shipment.

The man who is investing his capital and brains in the manufacture of such goods is anxious to know what the prospect requires. Much can be done in the solution of these problems by a personal interview or by correspondence.

Secondly — Cooperation between friends. This is very helpful and tends to develop enthusiasm and friendly rivalry in model construction.

Thirdly—Cooperation by joining a Club or Society; where enthusiasts gather together and have a workshop, hear papers read and discussed, plan for competitions and races; and once a year hold an exhibit of work accomplished.

There are a number of expert Modelmakers scattered through this great country and there are many novices who would like to enter the ranks and take up this fascinating pastime. Cooperation between these different units will mean the formation of friendly groups and from these groups will come new clubs which in time may all be linked together embracing the modelmaking fraternity of the whole country.

Cooperation begets competition, encourages enthusiasm, develops inventiveness and the creative genius required for the production of fine workmanship.

If there is any Club or Society in your locality get in touch with the Secretary. If you are not near any such organization, try and find some kindred spirit in your town and have a friendly meeting once in a while. These things will all help the individual Modelmaker and the upbuilding of American Modelmaking.

We shall be glad to help any of our readers by giving them the names and addresses of any other readers who may be residents of their particular locality.

SOME MODEL LOCOMOTIVE KINKS

By G. A. DIEHL

These three little kinks will be most valuable to the model engineer who cannot get castings to suit his particular requirements.

The first one is a way to make and fasten domes in place. The dome as shown in Fig. 1 is turned to the proper diameter and rounded on the end to suit the builder, from a piece of steel shafting. The dome should be bored inside to make it light and to provide space for the fastening parts. After the dome is shaped properly and bored inside it should be placed on a sheet iron drum the same size as the boiler it is to be mounted on and solder run around the bottom edge, in fairly large quantities, with a small alcohol torch as in Fig. 2. Acid core solder is best. The sheet iron drum is only used in case that the outside boiler casing is made of Russian iron and to be left unpainted, as the acid in the solder will leave a permanent stain on the Russian iron. If the boiler casing is to be painted, the extra drum isn't necessary as the solder may be formed on the regular casing without harm to the finish. After enough solder has been melted around the dome and cooled, take a round file and make a neat fillet in it all around. The solder takes the shape of the boiler barrel as perfectly as though it were part of the boiler shell.

Fig. 3 shows how the dome is fastened in place. First make a "U" shaped piece, with feet on it, of sheet metal which is fairly stiff, to go inside of the dome. (Reference to the drawing clearly shows this.) Put a long screw in the "U," then bolt the "U" to the boiler casing with small flat head machine screws with the heads inside the casing. Tap the center of the dome to fit the long screw in the "U" and screw the dome down. Tighten the screw up with pliers, then cut off and file flush with the dome. This makes a neater fastening besides being stronger, than a dome that is soldered in place.

The second kink is my way of making the front ends of a locomotive. Fig 4 is a sectional view of the completed front end. The end is made in two pieces, make a lighter piece when finished and to prevent wasting a large piece of stock. The large one is turned out of ½ inch steel plate, in my case, and the smaller one of a piece of 2 inch shafting. The sectional view shows how they are shaped and their approximate thickness also. They are held together in the center with a screw.

I used size 0-80 round head machine screws neatly spaced around the rim to imitate rivets. The whole front end is hinged to open. It can be seen that when the entire front end opens one can make adjustments in the smoke box more easily.

The last kink, and really the most important, is a way to make cylinders without castings. Figs. 5, 6 and 7, almost explain every detail. The saddle plate, center plate, and end plates are ⅛ inch steel cut to the required shape and size and are brazed together. The ports are drilled

Model Locomotive Kinks

Fig. 1

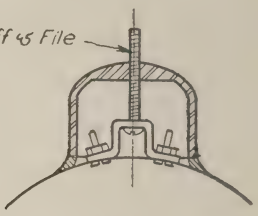

Fig. 3

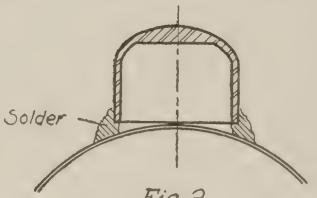

Fig. 2

Fig. 4

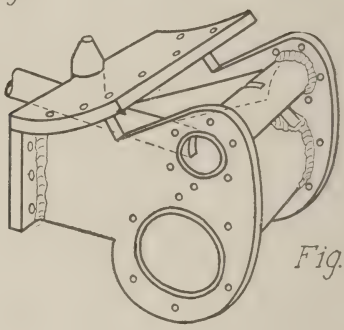

Fig. 5

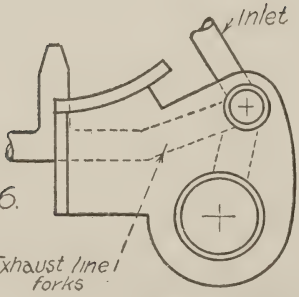

Fig. 6.

End View of Cylinder

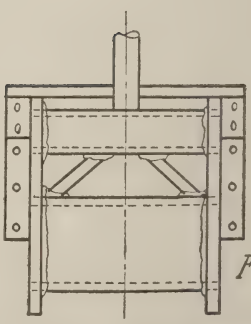

Fig. 7

Side View of Cylinder

and filed in the valve and cylinder tubes with a thin flat file before they are brazed in place. The ports that connect the cylinders with the valves are flattened tubes brazed in place. The saddle is drilled and tapped to screw on the smoke box. The center plates are also tapped so the cylinders when complete may be fastened together with screws. After all brazing is done the cylinders and valves may be reamed to proper size and the center plates filed perfectly flat and parallel to the cylinder walls. The completed cylinders are fastened to the main frames by angle pieces. The cylinder heads are made as any other cylinder heads and fastened on the cylinder ends with six small screws. A reasonably accurate job may be had with ordinary good care.

Dimensions are left almost entirely to the user of these ideas as dimensions are limitless and are beyond the scope of this article.

L. B. S. C. 2½ inch Gauge Atlantic Test

Mr. L. Lawrence

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L. B. S. C. 2½ inch Gauge Atlantic Locomotive

Mr. Jas. A. Joslin, Sec'y, C. M.E.C., kindly loaned as a photograph to make an illustration of this Locomotive which is shown on the front page of this issue.

While in London last summer Mr. Joslin visited Mr. Lawrence and we understand saw this locomotive under steam. He writes the following regarding this beautiful piece of modelwork.

"The L. B. S. C. famous 2½ inch gauge Coal Fired Atlantic. The Locomotive that made history, shattered records for hauling power and upset all accepted theories of Model Locomotive Design. Owned and Built by Mr. L. Lawrence, member of the London Society of Model and Experimental Engineers."

Mr. J. H. Koch, of 103 Summit Ave., Linwood, Pa., is quite an experienced and enthusiastic Modelmaker, always ready and willing to help any brother enthusiast. We understand he has a group of amateurs who he is helping. We would suggest he try and form a Modelmakers' Club in his town. All of our readers in his vicinity should get in touch with this gentleman and see if they cannot help him to organize a real live Club that would prove not only a benefit to themselves but another link in the chain of Modelmakers' Clubs that we hope in time will spread from Coast to Coast and put American Modelmaking in its rightful place. Get busy Boys and help the good work along.

SOME NOTES ON CONSTRUCTION OF ½-IN. SCALE K 4 S, P. R. R. LOCOMOTIVE

By H. J. COVENTRY, Assoc. Mem. A.S.M.E.

(Continued from page 58)

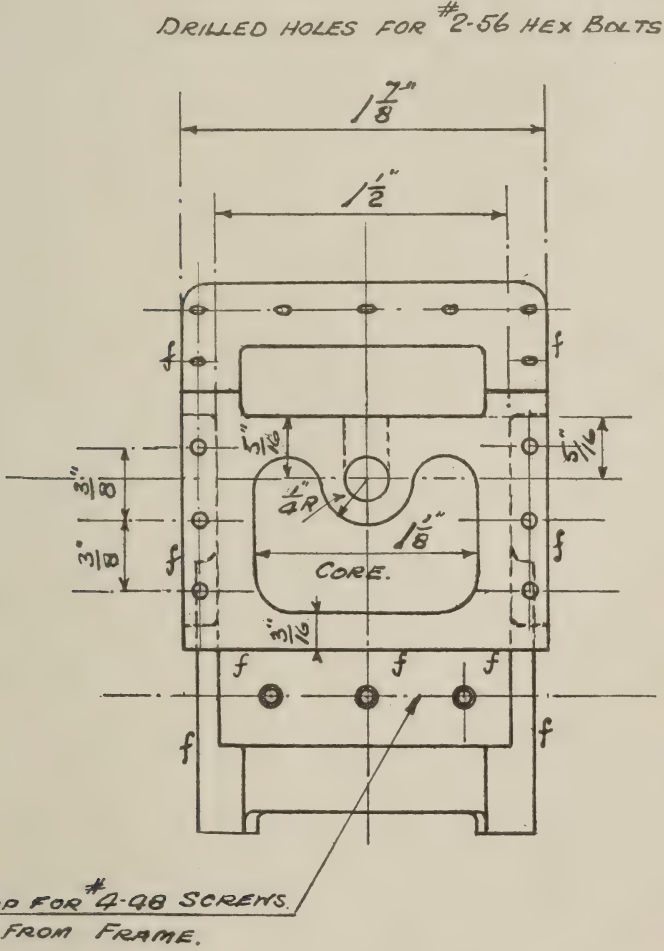
Cut flue tubes to correct length and screw on end. A slightly taper thread is an advantage.

The opening in boiler barrel should be cut out by drilling a series of holes close together, and rimming the metal between with a small round file. The steam dome, base, throttle box and cap being already made, the base should be now attached to barrel, by a row of brass screws, tapped into barrel and liner. The joint is made steam tight with asbestos paper, oil and graphite, or any good steam gasket that is thin enough for the purpose.

The steam pipe must now be screwed into throttle box and throttle valve and rod placed in position.

Everything is now ready for assembly and a definite sequence of connecting the various parts necessary, or it is quite possible to find, after making several joints, that it is impossible to rivet the last one. Therefore, proceed as follows: First see that all joints are tinned, then take the back head plate and rivet it to the already bent and shaped outer wrapper. Second, rivet the throatplate to other end of wrapper. Third, rivet barrel to throatplate. It will be found that the "holding on" riveting tool will reach all rivets easily, either through grate space or barrel.

Now take the firebox, which is already riveted except for mud ring, insert in boiler and cramp in correct position; drill, say two holes, through each side of mud ring and mark out the opening for firehole from the back head. Next remove the firebox and cut out the firehole to line. Tin all around the firehole and replace, locating by the four holes already drilled. Drive in four rivets, but do not head them yet. Proceed with drilling and when all is done remove box once more and clean off all burrs. Replace and rivet up. Now take the tubes, coat screwed ends thinly with solder, and screw into firebox, while the tube is hot; see that the tubes come through the firebox tube plate about 1/32″ or 1/16″. The final



operation is to place the smokebox tube plate in position and rivet to barrel, and then expand the tube ends into plate, with a taper drift.

Go over all the joints with the torch and heat sufficiently to cause solder to run. The boiler should now be steam tight, or very nearly so.

To test connect a tire inflator to one of the superheater holes, or to cylinder steam pipe, plugging up all other openings. Pump in about 30 lbs. air and place whole boiler under water. Any leak will immediately make its presence known, and the offending joint treated with the torch. When no more leaks show, fill boiler full of water, so that no air whatever is left in. Have a pressure gauge and check valve in the pump delivery pipe, or they may be connected in their proper position. Fill pump with water and work piston till a pressure of 100 lbs. is registered. The pressure should not fall rapidly, although it may gradually fall over a period of time, due to causes external from boiler. If no water shows at any joint, and all stays are intact, the boiler is quite safe for its working pressure of 55 lbs. And now that the generator is available, the engine may be tested and valves set.

The boiler need not be mounted on frames, but steam pipes run from it to engine. This will give plenty of room to work around the valve gear. A gas burner or gasoline torch in the firebox will raise all the steam required, as 15 lbs. should be ample to turn the engine over with wheels raised clear of rails. The valves should be set for 1/64″ lead, although the best setting should be found after running on rail with load behind tender.

When preliminary test is satisfactory the boiler must be lugged with asbestos cloth, the outline built up with wood blocks, held on barrel by thin brass bands. The wooden jacketing should be covered till the prototype outline is obtained, when it becomes an easy matter to cover with thin brass.

Before cutting the sheet brass it is better to cover the boiler with paper, fitted snugly all over. When this is removed a correct template is obtained, from which the brass is cut.

Dome covers may be spun or beaten out over hardwood formers.

The boiler may now be mounted on frames and is bolted to cylinder saddle at front end, and through a furnace bearer, which takes up the expansion through slotted holes at firebox end.

The cab is built of 22 G brass, screwed to an angle laid across top of boiler. The roof is made capable of sliding off to facilitate adjustment of fittings, but for merely driving it is only necessary to slide back the roof ventilator. An extension handle to slip over the throttle lever makes it easy to operate through the venilator.

A 4—8—4 DOMINION TYPE THREE CYLINDER, HEAVY DUTY TANK LOCOMOTIVE, 2½" GAUGE, FREE LANCE DESIGN

THE STORY OF ITS CREATION

By JAS. A. JOSLIN

An outline drawing of this locomotive appeared on page 9 of the January issue of the "Modelmaker" but unfortunately this brief account was too late for publication in that issue. The following details of the why and wherefore of the design and a description of the "works" that are going into her make-up are given in the hope that they may be of interest to model locomotive men, more particularly to those who do not adhere strictly to scale designs of existing prototypes, whether they be American, English, European, etc.

While an ardent admirer of the Modern English Locomotive with its graceful outlines, smart livery, the perfection of finish bestowed upon every detail, it was the desire to build something really big and powerful that led to the preparation of a number of free lance designs embodying, generally speaking, English locomotive practice combined with American locomotive proportions. These designs included Atlantic, Pacific and Mountain Types.

After much consideration the 4-8-4 Dominion Type Tank Locomotive was selected from which to build a model. The Pacific design would have won the day, but the writer already has one under construction, further reference to which will be made later. The outstanding features in the present design are the employment of three high pressure cylinders, ¾ bore and 1⅛ stroke, 8 large diameter driving wheels, a boiler of large diameter and a firebox of great length. Being a tank engine gives it the ability to run equally well in either direction and makes the overall length much less than that of a tender locomotive.

While the design is a free lance one it was not intended to represent simply a boiler on wheels, and therefore much attenion was given to the proportion of the various parts and details of

external appearance, so as to make the engine present a bold, massive, yet pleasing appearance. Generally it follows British Locomotive practice except for the Headlight and Automatic Couplers which are typically American.

The preliminary design was gotten out as far back as April 1924 and was the last of the free lance designs to be prepared. An immense amount of time had been expended in bringing things to this stage, and while the design looked good on paper the building of such a complicated machine presented many difficulties and problems and called for the very highest skill in the execution of the work. Having neither the time, workshop equipment or the ability to build such a locomotive myself, and past bitter experiences in getting someone else to do the work having caused me to vow "never again," I almost despaired of ever being the possessor of the finished locomotive.

Due to circumstances beyond my control I had to leave for England early in June and took my drawings with me. I fully intended to make the acquaintance of as many Model Engineers as possible while there, and therefore, having visited the offices of the Model Engineer in Farringdon Road, London, where I secured a number of names and addresses, I set out on my tour. The first on the list was L. B. S. C., well known to readers of the Model Engineer. I was delighted to meet him as I had already heard of his fame and am the happy possessor of a sample of his handiwork in the form of a loco boiler which replaces a watertube one on the aforementioned Pacific Loco. One look at this gentleman's workshop is enough to convince one that he knows his business, but one ride behind a ½" scale Atlantic loco of English proportions built by himself convinced me that he was the man to turn out the Dominion Tank.

As an American Model Engineer recently remarked, "He's the wonder model locomotive man," and that truly describes him. But the secret—let me tell you. He is a practical railroad man who has handled the real machines and when he makes a model it is modelled along the lines of the full sized machine and that's why it is a success. I think that is a valuable piece of advice to American model loco engineers and if observed will save much time, money, experimenting and disappointment. I have been through these stages so can speak from experience.

Well to return to the subject. Since my never-to-be-forgotten experience as loco engineer on a ½" scale, 2 cylinder Atlantic

locomotive, I've been wondering how much or how many people my tank engine will haul when completed. There's no telling so we shall just wait and see. Before actual work was commenced we talked over several points of the design and at the suggestion of L. B. S. C. the boiler was increased in diameter and three cylinders were used instead of two. The boiler was the first to be taken in hand and was completed in time to bring it back with me. It is really a wonderful piece of work and under preliminary test it raised steam from cold water to 80 lbs. in 5½ minutes, burning charcoal and coal mixed. The firebox is no less than 7 inches long and the ashpan is equipped with L. B. S. C.'s original device for dumping the fire in an emergency. The chassis is now under way and when it arrives I shall be glad to add a description of it should readers be interested.

While the model is a free lance design in making comparisons with existing locomotives a scale of 17/32" to the foot was used as a basis, this being the proper scale for 2½" gauge.

I give below the leading particulars and the following table shows the dimensions and proportions of this engine if built full size. The scale of 17/32" to the foot has been adopted in converting these dimensions.

Boiler—Seamless drawn copper tube 3⅜" diameter.

Tubes—Seven ⅜" diameter and Two 9/16" diameter, superheater flues.

Firebox—7" long and 1⅞" wide.

Grate Area—8.25 sq. ins.

Boiler Pressure—90 lbs. per square inch.

Safety Valves—Two Ross Type Pop.

Boiler Fittings—Throttle Handle—G. N. R. (Old Style), Pressure Gauge, Water Gauge, Whistle (Spring Lever Operated), Steam Blower, Three Check Valves, Four Wheel Valves supplying Injector, Steam Brake, Sand pipes and one spare, Throttle in Dome, Snifting Valve.

Boiler Feeds—Eccentric Driven Pumps (Two). Hand Lever Force Pump (One). Injector (One).

Cylinders—Three High Pressure, ¾" bore x 1⅛" stroke.

Valve Gear—Walschaert's. Three Sets.

Driving Wheels—Eight—3⅜" diameter.

Bogie Wheels—Eight—1½" diameter.

Leading dimensions for full size engine on the basis of 1 foot to 17/32 inches.

Coupled Wheels	6′ 4 ″	dia.
Bogie Wheels	2′ 10 ″	dia.
Coupled Wheelbase	20′ 4½″	
Total Wheelbase	45′ 6½″	
Length over Buffers	55′ 7½″	
Diameter of Boiler over Lagging	6′ 8 ″	
Diameter of Smokebox	6′ 10 ″	
Center Line of Boiler above Rail	9′ 7½″	

WHAT MODELMAKERS REQUIRE

We have had a number of inquiries from readers residing in country towns and on rural delivery routes, who were anxious to get small quantities of brass or copper tube, sheet metal, steel rod, etc., etc., materials they could not purchase near home, so they had written to us to know where they could be bought.

We have given this question some thought and have come to the conclusion that the only way to handle this matter successfully was to get some gentleman well up in Modelmaking and familiar with all the material and supplies necessary for the construction of a model to act as a buying agent for our good friends in country places.

We have found a man, whom we believe is just the one to fill the bill, Mr. Thomas J. Bray, 35 Summit Ave., Jersey City, N. J. Mr. Bray has worked in the railroad shops as a machinist and is a first class modelmaker of many years' standing. We have known him intimately for nearly thirty years and have always found him very straightforward and reliable in his business transactions with us.

Mr. Bray will be very pleased to hear from any of our readers who would like to engage his services. In writing to him, kindly enclose a two cent stamp for reply.

Mr. J. W. Neptune, 130 Paul Ct., Akron, Ohio, would like to get in touch with any reader in his town or vicinity interested in Modelmaking. Mr. Neptune has built quite a number of models and is now actively engaged in the construction of a 0-4-4-0 Electric Locomotive modelled after the first 100 ton B. & O. Tunnel Engine.

Mr. Wm. Chamberlain has just completed building the two cardboard Loco. Models described on page 35. It requires considerable patience and perseverance to execute the work satisfactorily but they certainly look very good, and make very attractive ornaments for the top of the book case.

Send 2 Cent Stamp for Best Books for Modelmakers. Spon & Chamberlain, 120 Liberty St., New York.

MODELS OF OLD SHIPS

The following item will give our readers some idea of the real monetary value of fine old Ship Models. The balance of Mr. Nelson Dawson's collection of Marine art objects were recently sold in London, England. An admiralty box wood model of an English man-of-war of 1790 was sold for $2,900.00; an admiralty model of a fifty-four gun frigate of 1824, in box wood, brought $1,600.00. A full-rigged bone model of an English man-of-war of ninety-six guns, made in 1800 by French war prisoners, brought $485.00, and a late eighteenth century model of an English man-of-war of one-hundred and twenty-four guns, sold for $350.00. A set of four marine prints, showing incidents of the British fleet off Long Island, brought $400.00.

Of course models like these are not to be confused with a ship load of so called "antique model ships" of recent construction and inferior workmanship made in Europe and recently imported into the U. S. and sold to the American public at high prices as real antique models.

We have before us a copy of The C. S. M. E. Journal, for April, 1925. The two principal articles are a Model Dutch Yacht, by Alfred S. Brownell; and Hardening Tool Steel, by C. H. Grill. The Chicago Society of Model Engineers' recently completed its tenth year. It was organized with three members and now its strength is nearly 100. During its existence it has had eight Annual Exhibits of Models; the two most important ones were held at Marshall Field & Co., in the fall of 1921; and The Fair, in the fall of 1922. They are now planning for the Ninth Exhibit and hope to make it even more successful than previous ones. Mr. S. C. Swanson, Sec., 7826 Coles Ave., Chicago, Ills. will be glad to hear from any Modelmaker who is not a member.

NEW BOOKS

Clockmaking, Past and Present, by G. F. C. Gordon, VIII-232 pages, 29 illus., 35 page plates, 8¾ x 5¾ in., cloth, $6.00.

Contents — Materials, Tools, Wheels and Pinions, Escapements, Pendulums, Motive Power, Striking Mechanisms, Lantern, Long-case and Bracket Clocks, The Age of a Movement, Ornamental Clock Hands, Restoration and Repairs, Clock Trains, Repairing American Clocks, Turret Clocks and Bells, Bibliography, Bell Striking Mechanisms, Gravity Escapements. A very important addition to the existing literature on this interesting subject.

Electric Wiring Diagrams for Motor Vehicles by M. A. Codd, 2nd edition enlarged, 151 pages, 10 x 6¾ in., cloth, $1.25.

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Hammond Typewriter, good as new. List price $100. Will take $55.00. F. S. S., P. O. Box 423, Brightwaters, L. I., N. Y.

Locomotive Charts, large Sectional Views numbered with a list of the parts. American Type, Atlantic Type, Consolidation Type with Walschaerts Valve Gear, Micardo, or 2-8-2 Passenger and Sleeping Car, price 25 cents each. Pacific Type or 4-6-2 size 44 X 17 in., price 50 cents. Spon & Chamberlain.

Amateur Work, some back volumes in numbers, Edward Chamberlain, 215 E. North Ave., Cranford, N. J.

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SOCIETIES

Boston Society of Model Engineers, J. L. Brackett, 13 Charles St., Wakefield, Mass.

Brooklyn Model Yacht Club.

Canadian Model Engineering Club, The Sec., 122 Pacific Ave., Toronto, Ontario, Canada.

Canadian Model Engineering Club, Montreal Branch, F. L. Lewis, 139 Dobie Ave., Mount Royal, Montreal, P. Q., Canada.

Central Park Model Yacht Club, H. Griffith, 609 W. 147th St., New York.

Chicago Society of Model Engineers, S. C. Swanson, 7826 Coles Ave., Chicago, Ills.

Detroit Model Yacht Club, J. H. Hinchman, Dept. of Recreation, 504 Elmwood St., Detroit, Mich.

Montclair Model Engineers Club, C. L. Chamberlain, 156 Newark Ave., Bloomfield, N. J.

St. John Model Boat Club, Harry Ervine, Telegraph and Times Office, Canterbury St., St. John, New Brunswick, Canada.

Toledo Model Yacht Club, G. A. Heine, care of Meilink Steel Safe Co., Toledo, Ohio.

Books for Modelmakers, all fully illus. paper covers, 35 cents each:

Model Boiler Making.
Model Steamer Building.
Machinery for Model Steamers.
Model Steam Engine Design.
The Locomotive Simply Explained.
Model Steam Turbines.
Beginners Guide to the Lathe.
Model Steam Engines.
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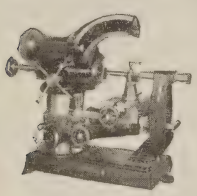

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VOL. I.—1924

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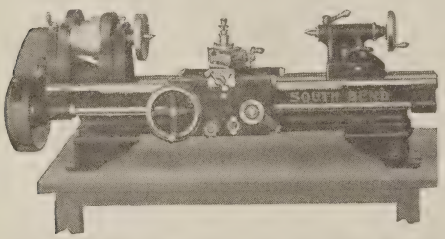

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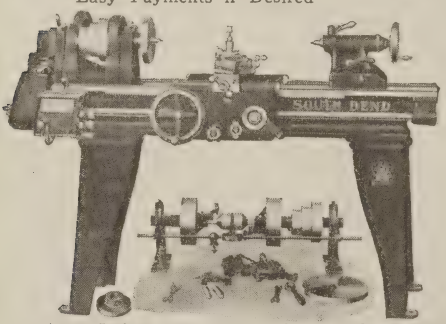

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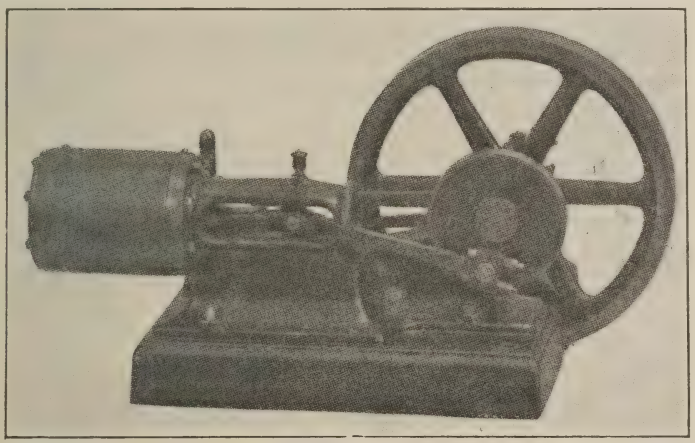

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OUR FOREWORD

In Our Foreword of January, 1925 we devoted some space to the announcement of a new English Magazine entitled "The Model Railway News." The writer has before him copies of the first five issues of this fine Magazine. It more than comes up to the expectations of the good articles we were sure it would contain, from a perusal of the elaborate circular sent out by the Publishers. We find some very interesting articles describing a number of private owned and operated model railway systems, ranging from 00 gauge to 7¼ in. gauge. Including a great variety of locomotives, both steam and electric; railway stations; freight and passenger cars; signals and track work; bridges and tunnels; for indoor and outdoor systems. "Our Mail Bag" contains many interesting letters from readers in different parts of the World. "Queries and Replies" deals with much useful and practical information. The principal articles are profusely illustrated with drawings, diagrams and halftones.

In another part of this issue will be found the titles of the principal articles in the first five numbers. The general get up of this magazine is excellent and the size just right.

The Modelmaker who is especially interested in this branch of Model Engineering will find in this Magazine a wonderful fund of practical information and the experiences of other enthusiasts, some of whom have spent years of work in developing their own particular model railway system.

The Publishers are to be congratulated on the production of the best Magazine ever published on Model Railways and we hope that they will have the hearty support of all those interested in this fascinating hobby.

A number of our American readers have already sent us their subscription for the current year. We shall be very pleased to give fuller particulars to any one who may be specially interested in model railway work.

Mr. Adolph Bosshardt, 99 Getty Ave., Clifton, N. J. writes that he has built several model boats, and that he would like to see a model power boat race. If any of our readers know of any races that are planned to take place this summer near New York, would they kindly notify Mr. Bosshardt, giving the date and where the race will be run off.

CHAMPIONSHIP MODEL YACHT RACES

These will be held at Eastern Yacht Club, Marblehead, Mass., on July 12, 1925. Open to Class "B" and "6 Metre" models. There will be first and second prizes in each class, awarded by Commodore Ayer, of the Eastern Yacht Club.

Entries

All Entries must be in writing and mailed to the Boston Model Yacht Club, care of Chandler & Farquhar Company, 250 Devonshire Street, Boston, Mass., not later than Wednesday, July 1, 1925.

Give: Length Overall-Length Load Waterline — Beam — Sail Area—Rating.

Racing Numbers will be furnished for all Entries.

Transportation of Boats: All Boats should be shipped care of Professor George Owen, Massachusetts Institute of Technology, Cambridge, Mass.

The Marblehead Model Yachts, Inc., recently gave a very interesting demonstration at 260 Devonshire St., Boston on Model Yacht Building, showing in a practical way the different stages in construction, starting from the rough block of wood to the finished product.

This issue of The Modelmaker will be in the printer's hands before the results are known of the Boston Model Yacht Club Races. There will be contests for the following classes: B "Class—46" Rating under M. Y. R. A. A. "6 Metre" International Class—30.36". Rating under special rules by "English Yachting Monthly." 1st Special Class—18" to 36" overall length and 2nd Special Class—36" to 54" overall length. There will be three prizes for each class. We wish them every success, numerous entries, fine weather and plenty of Wind.

There are three good reasons why Canadians interested in Modelmaking should join the Canadian Model Engineering Club. First—It is a live up-to-date organization full of get-up and enthusiasm—always ready and willing to help a new man over his obstacles. Second—It has a workshop where a member can get the necessary tools to do work he cannot manage with his own outfit, and where he can get assistance. Third—It has a library from which a member can obtain books likely to be of help to him in his hobby. Write to the Sec. C. M. E. C., 122 Pacific Ave., Toronto, Ontario. There is also a branch of this Club in Montreal. Mr. F. L. Lewis, 139 Dobie Ave., Mount Royal, P. Q. Canada.

Mr. Edgar L. Brown, informs us that he has built a number of ship models in the past few years. He recently switched over and is now busy on the construction of a ½ in. scale Pacific Type locomotive. He writes to know if we can give the names and addresses of any Modelmakers in his vicinity. His address is care of Schiffman Jewelry Co., Greensboro, North Carolina. If there are any of our readers in his locality, we trust that they will write to this gentleman. He would like to meet some fellow enthusiasts occasionally to talk over model matters.

HIGH SPEED HORIZONTAL STEAM ENGINE

By MR. R. M. DE VIGNIER, M. E.

The following description of a small steam engine built from my designs, will interest all who are desirous of exercising and cultivating their mechanical ability during hours of recreation, as well as a large number who wish to develop their practical knowledge of steam engineering. To the latter I confidently offer this small model as being carefully designed to embody the most modern features of construction compatible with its size.

The accompanying illustration gives an excellent idea of the appearance of the finished engine, whose leading dimensions are as follows:

Specifications

Cylinder—Cast Iron—1⅛" bore x 1¾" stroke.
Valve—Bronze—Piston Type.
Valve Chest—Cast iron with seamless brass liner.

The steam ports are of generous proportions (⅛"x⅝") to allow of high speed, 1200 revolutions per minute being easily attained with an adequate supply of steam. The valve has a throw of 5/32" and a lap, on the steam side, of 1/16"; this gives a maximum port opening, to steam, of 3/32" x ⅝" and the entire port, ⅛" x ⅝", is available for free exhaust, thus preventing any possible throttling of the engine at high speed through back pressure. The valve should be set to give about 1/64" lead when the crank is on the dead centre.

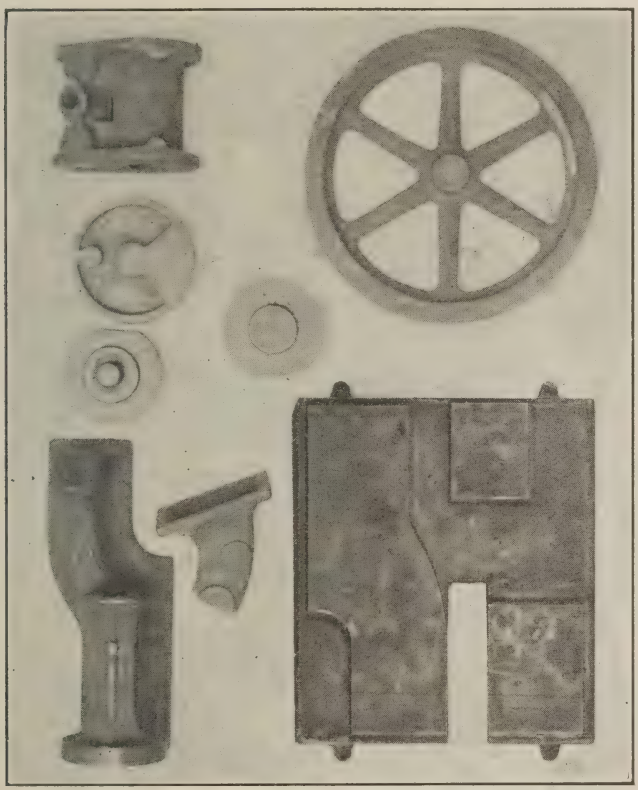
The Frame, Crosshead Guides and Main Bearing are in one casting, to secure the maximum of rigidity and to facilitate construction. Both this casting and the out board bearing are mounted on a rigid base, on which provision is made for the further fitting of a feed pump. The latter is geared from the crank shaft to run only one-half as fast as the engine, as small pumps do not operate satisfactorily at high speeds. Because of this reduction in its speed, its capacity is increased proportionately, and it will be found to more than meet the demands of the engine at all speeds. For this reason, I recommend the fitting of a by-pass valve in the feed-pipe from pump to boiler, to take care of the excess water and return it to the supply tank.

The pump has a bore of 9/32" and a stroke of ⅝" and is fitted with ball valves and an equalizing air-chamber.

Bearing Surfaces throughout the engine are large, and means are provided for taking up wear wherever necessary.

The Piston has a wide face and is fitted with two spring rings.

Glands are of the best design and are so constructed that they will not work loose and require more than rare attention.



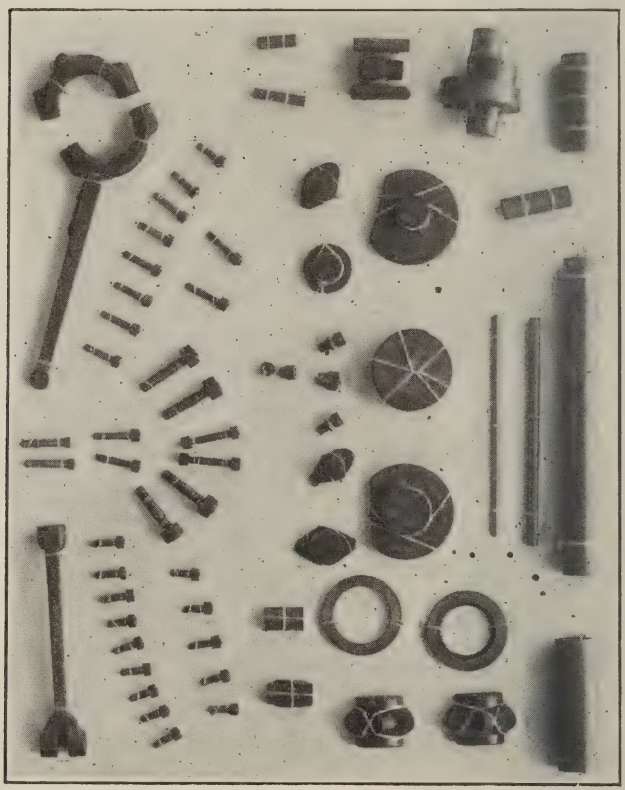
The Engine is put together with steel bolts and studs with hexagon nuts, and the piston rod and valve stem are of bronze to prevent their corroding and sticking fast during periods of disuse.

The Engine being designed to cut-off at about 80 per cent of the stroke, the following figures regarding its power have been established and may be of interest.

At 50 pounds steam pressure, by gauge, and at 500 R. P. M. the Indicated Horse Power equals 3/16.

At 70 pounds steam pressure, by gauge, and at 500 R. P. M. the Indicated Horse Power equals ¼.

At 1000 R. P. M. the power will, of course, be twice these amounts.



The sets of working drawings* leave nothing to the imagination; nothing to be figured. Every part is separately detailed and fully dimensioned, down to the bolts and nuts, for the information of those who prefer to make the latter themselves.

For the assistance of Amateurs, the design has been simplified to the greatest extent possible.

For those who propose building a boiler for this engine, it may be of interest to know what its steam consumption is, in order that the boiler may be made of suitable size.

With the cut-off arranged as it is for 80 per cent of the stroke, the volume of steam required per stroke by a cylinder 1⅛", is 1.40 cubic inches; the volume of steam required per revolution will be twice this, or 2.80 cubic inches of steam.

From the foregoing I have computed the amount of steam and its equivalent in cubic inches of water at various pressures in pounds per square inch by the gauge, and at various speeds in revolutions per minute, and present them in the following simple table.

R. P. M.	Steam in cubic in. per minute at all pressures.	Water in cubic in. per minute at pressure of 50 lbs.	60 lbs.	70 lbs.
500	1400	3.45	3.94	4.43
600	1680	4.14	4.76	5.31
800	2240	5.51	6.30	7.08
1000	2800	6.90	7.88	8.86

Assuming that 100 square inches of direct, or effective boiler heating surface will evaporate one cubic inch of water per minute (which is a conservative figure for model boilers, as they frequently do much better than this if well figured), it is merely necessary to multiply the figures given for water consumption in the above table by 100 to have the heating surface required at any given speed and steam pressure. Thus, in the case of 500 R. P. M. and a pressure of 50 lbs., a heating surface will be required of 345 square inches.

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*NOTE—Sets of blue prints can be purchased from Spon & Chamberlain.

Mr. G. L. Grimes, 48 Thompson St., Springfield, Mass., would like to receive the name and address of any gentleman in his locality who is interested in Modelmaking.

Mr. H. O. Havemeyer, Jr., of Mahwah, N. J., is considering the construction of an O. O. Pacific 5/8" gauge Loco. He would like to get in touch with some one who could supply wheels or parts.

MODELS AND COSTS

By GEO. A. CUTHBERTSON

The writer once, when a youngster, remembers seeing a beautiful model locomotive made by one of the old school of modelmakers (a beautiful job it was, too), and he asked this veteran the cost of the locomotive. The old man in a rather amused way asked whether it was the cost of material in the model, or the cost of time used in making it. When he was asked what the cost of material was, the answer proved that it was comparatively small. In fact, the same money would have bought a very poor sample of a ready made toy engine. Therefore, this particular model's value was in its wonderful workmanship, and the matchless skill put on it.

Now this happens to be the case with most models. The cost of the raw materials used in their construction is the smallest part of their value. Take for instance some of the beautiful architectural models made from pasteboard and plaster of paris. The materials used in their construction are worth practically nothing at all. Yet the finished models are almost priceless in value.

Some modelmakers who build models for the sake of doing a good job, are not very careful to put a proper value on their work. This is not businesslike, and these people should begin at once to take stock and reckon up the values of their work. Models should always carry insurance against fire at least. Also if models are being shipped from one place to another, for exhibition purposes, they should carry transit insurance, against fire, breakage, depreciation and theft.

Now there is no use whatever in approaching an insurance company with a fancied value on your model. You must show basic costs to back up your value. Then supposing you have a model that has been insured, and that this model goes through a fire, and comes out as salvage, you must put in a claim to cover the cost of making your model what it was before any damage was done to it. To do this several lines of value and cost must be taken into consideration.

These are as follows:

Actual cost of all materials put into the model before assembly.

Actual cost of all shop time used in construction at a given rate per hour.

Value of model for sale purpose.

Value of model as an exhibition job where prizes are the objective.

Value of the model as a recreative source of amusement.

Value of the model as an experimental proposition.

Value of the model as an ornament.

To determine the first item, a table of materials required should be drawn up and added to, as the job progresses. These can be kept on a separate sheet for this purpose alone. To this table should be added all shop breakages to tools and equipment, and a fair replacement value put on same. A time sheet should be kept for labour expended for the entire job. This should cover even the trials of the model. A third sheet should contain the other items given.

Thus on three sheets of paper you have the actual value of your model in hard, round figures. There are no "I thinks" then, about the matter.

Some people may imagine that all this is unnecessary, and who on earth is going to take the trouble of chalking up everything connected with a job. The Insurance question has already been put forward in reckoning true values, against such opinions.

But apart from this, are there not other reason to consider? Does it not sound like commno sense to put forward this suggestion, namely, to see just how cheaply a model can be constructed with maximum amount of finish and good workmanship, at minimum amount of expense in erection?

By doing this, if you have several models at an exhibition, and one of them takes a prize, you can at once see on which model you have wasted time and patience. The results are sometimes surprising. The very model that has taken the least time, energy and money to build, is the one that takes the prize; whereas, the job that you thought was going to be the best of the lot, is passed by when the judges come around.

Having thus given a sketch series of remarks for the benefit of the initiated, it will be well to conclude with a few remarks to the uninitiated, and those who have never taken up model making seriously or those who think model making is only for those whose pockets are full of money.

Model making is not an expensive matter. Models that are true in every detail to their prototypes can be built with the simplest tools and materials, after all, it all depends on the aims of the modelmaker. To build a model locomotive, one does not

need a complete shop, unless he wants to make every nut and bolt himself. For the man of average means, the best plan is to buy all the castings and parts raw and do all the finishing and erecting. A set of castings, etc., can be purchased for about twenty dollars at the outside, and with another ten or fifteen dollars worth of tools, a model can be built that will be a pride and joy to its builder.

Model ships are usually constructed of the simplest and cheapest of materials, with comparatively few tools. The writer has seen models of ships, completely equipped, made almost entirely of bone, hair, glue and pins. Therefore, as a final word, size up the cost of your job before you do it. Don't confine just your lay out drawings to paper, but put your cost on paper. Do not fail to do this or you will find yourself putting more jobs up on the shelf, "to be finished later" than you will ever turn out. Many an erstwhile fine model is lying right this minute on some dusty shelf for the simple reason that costs were not considered beforehand; and many a man has never received one cent of recompense when his model was burned up in a fire, because he wasn't sure of his costs and values.

Model Railway News. The following are some of the principal articles found in the first five issue of this very interesting Magazine. Model Railway Engineering as a Hobby. The Possibilities of 00 Gauge. A Model Express Electric Motor Coach. An Indoor 1¾ in. Gauge Model Railway. Model Railway Terminal Station Plan. Track and Wheel Standard for 0 Gauge. A Model Railway at Mill Hill School. Gradients on Model Clock Work Railways. The Downs School Railways. A High Capacity Bogie Wagon. Walschaerts' Type Valve Gear for No. 0 and 1 Gauge Steam Locomotives. Making 0 Gauge Track. A Model "Challenger" 2—8—2 Engine Type for an Indian Model Railway. Design for a Model 0 Gauge Electric Locomotive. Model Hydraulic Buffer Stops. Mr. W. A. Gosheron's Gauge 1 Model Railway. Making a Gauge 1 Bogie Coach. Model 0 Gauge L. N. W. Railway System. Design for a Simple Model 2 in. 4—4—0 Steam Tank Locomotive. Notes on Model Wagon Building. Major Hugh Simpson's Model L. N. W. Railway. Making Signals for 0 Gauge. Reversing Motor for Gauges 0 and 1 Electric Locomotive. 00 Gauge Electric Locomotive Motors. Mr. N. Evans' 0 Gauge L. N. W. R. Model Railway. Semaphore Type Ground Signals. A Controller for Electric Model Railways. 0 Gauge, Points and Crossings. Notes on a 1 Gauge Model Railway. A Model Locomotive for India. Queries and Replies. Railway Club News. Correspondence, Sale and Exchange and many short articles on various subjects.

LOCOMOTIVE STEAM DISTRIBUTION

By JAS. G. DUNN

An Analysis of the Walschaert Valve Gear and Its Limitations

The Walschaert gear is the present recognized standard, within its limitations. It causes valve events that produce satisfactory steam distribution. This gear can be arranged for application to locomotives varying greatly in size, type and design, but its numerous forms of application preclude standardization of details.

Under favorable conditions it can be arranged to cause symmetrical valve movement, but this feature, however desirable, is usually sacrificed to a considerable extent in favor of structural necessities—in consequence the characteristics of motion vary greatly between the different forms of application.

Seven inches of valve travel is the limit of capacity. The link swing is then fifty degrees, the link block lift eighteen inches, the eccentric crank circle over twenty inches, and unless the main rod is exceptionally long the eccentric rod and radius bar angles are objectionable.

One very serious objection to the Walschaert gear is the fact that locomotives upon which it is used, particularly passenger locomotives, with a high speed valve setting, are unreliable in starting, because the maximum cut-off is not late enough to utilize full cylinder power on one side up to a point where the other side will be at an effective crank angle.

Again, in early cut-off the port opening is only lead plus 1/32 to 1/16, therefore considerable lead is necessary to secure effective opening.

The lead is constant for all cut off's. Lead is the width of port opening at the beginning of the piston stroke. Lead causes pre-admission. Pre-admission is the distance the piston must move to complete the stroke when the port commences to open, it admits steam against the advancing piston. At short or high cut-off this condition is detrimental to power, as pre-admission is quite early in the stroke, particularly with short valve travel.

It is a common misconception that starting power is retarded by constant lead valve gears, but in full gear the valve movement is so rapid while uncovering the port, that ¼-inch lead causes only 1/6 inch pre-admission, and with the piston only 1/6 of an inch

from the end of its stroke the crank angle is too slight to seriously retard the movement of the opposite crank which is then at its maximum angle.

The proportion that the sum of lap and lead bears to the total valve travel is what determines the per cent of maximum cut-off. The greater per cent the lead bears to the sum of lap and lead, the later will be the maximum cut-off.

If the sum of lap and lead is about twenty per cent of valve travel, the maximum cut-off will be around eighty-nine per cent of the stroke, which is sufficient to insure starting reliability. By starting reliability is meant the initial revolution of the wheels.

If the locomotive is at a state of rest in position for both cylinders to take steam, there will be no difficulty in starting, but if it is in position of cut-off on one side its opposite cylinder must provide starting power and with cut-off too early the crank angle will be too slight to revolve the wheels, for instance, in fifty per cent cut-off the starting engine is on dead centre.

From the foregoing it is evident that while considerable full gear lead is not particularly harmful in causing pre-admission, it is the cause of too early maximum cut-off, unless the lap and travel are properly proportioned.

To insure eighty-seven to eighty-nine per cent maximum cut-off with the Walschaert gear and with valve travel limited to seven inches, the limit permissable for lap and lead is 1 and 5/16 inches. At the beginning of the piston-stroke the width of exhaust opening is lead plus lap exhaust clearance (when the valve is given exhaust clearance).

To insure low intial back pressure the exhaust port opening or pre-release should be as wide as practicable at this point.

It is apparent that considerable lap is necessary to insure liberal exhaust port opening particularly initial opening. This is very essential, especially on locomotives with large cylinders, that is, cylinders over twenty-four inches.

With cylinders over twenty-four inches the permissable lap (that is, lap that will permit of a late enough cut-off to insure starting reliability) is not sufficient to give a wide enough pre-release to clear the cylinders of the larger volume of steam before the piston has arrived at the end and started to return, with the result that back pressure is set up on the negative side of the piston, making less effective the M-E-P on the positive side.

(This article will be followed by an article on the Dynamic operation of a steam locomotive.—J. G. D.).

THE BOSTON MODEL YACHT CLUB

By A. D. MANTON

It is small wonder that when the laurels went to New York last fall in the model yacht races for the Brooklyn Eagle Cup, the members of the Boston Model Yacht Club went to work with a will to uphold Boston's prestige as a leading yachting centre, by building fourteen class "B" boats with the sole idea in mind of going to New York this fall and bringing the cup to Boston, triumphant.

When the Model Yacht Racing Association of America decided to challenge England for the "Yachting Monthly Cup," the Boston Model Yacht Club invited the Association to hold the elimination races in Boston and this invitation was accepted. A grand series of races have been arranged for July 9th, 10th and 11th to be held on the Charles River Basin, both for the sixes or "English Challenger" class and "B" class boats. Four of the six metre boats are being built by members of the Boston Model Yacht Club and enthusiasm is running high.

The first of the fourteen Class "B" boats to be completed, was launched and tried out by her builder and owner, Fred L. Pigeon, of East Boston, this week. Amidst the clicking of the motion picture machines, many interested spectators watched the little craft slide easily down the ways, dip her bow and get under way so much speed and smoothness that two men in a dory had a hard pull to catch her within a quarter of a mile. Much is looked for from the "Circle" in the coming trials.

The first model yacht club in this part of the country was organized on March 10, 1924. Model yacht racing has always been one of the hobbies of the Boston Model Yacht Club's efficient Commodore, John W. Black. When a boy, in the Grammar School, he built a boat which won the "Boston Post Cup" as well as all the cups in races between East Boston and Lynn model yachts. New York and other large cities have for years derived a great deal of pleasure from model yachts and when Mr. Black proposed a Model Yacht Club for Boston, the idea was heartily approved by model yachtsmen not only from Boston, but from all parts of the State and the membership has increased steadily. The success of the Boston Model Yacht Club seems assured and this type of sport is rapidly coming to the fore.

For the first time model yachting has been recognized by a yacht club of the standing of the Eastern Yacht Club. This recog-

nition is deeply appreciated by the members of the Boston Model Yacht Club, as well as by all other model yacht enthusiasts. Great interest is shown in the race which the Eastern Yacht Club is giving for model yachts on July 12th at Marblehead, for which they have donated, through Commodore Nathaniel F. Ayer, two beautiful silver trophies for the winners in each of the classes.

The City of Boston, through His Honor, Mayor James M. Curley, has donated a beautiful bronze trophy for first prize in the "6 metre Class." A wall cabinet tool chest, with complete set of tools has been donated by Chandler & Farquhar Company as first prize in Class "B."

Some years ago, the Boston Post gave a beautiful silver cup, to be raced for on the Frog Pond, Boston Common, by the model yacht racing enthusiasts of that day. A fleet of some 75 boats were entered by boys and girls of all ages, as well as by men. It was some contest to run and quite a feat to arrange for the different elimination races and when it was all over, the "Bostonian," built and owned by Commodore John Black, only a boy at that time, had won the trophy. It is therefore with deep appreciation that the gift of the Boston Post to the model yachtsmen of this day is accepted. Always a staunch supporter of this type of sport, through its editor, Mr. Wm. A. Grozier, the Boston Post has donated two silver trophies for the winners of the first and second Special Classes.

A very interesting exhibit is being shown at the Marine Museum, Old State House, Boston, Mass., consisting of models, pictures and miniatures of the clipper ships, built by Donald McKay, at East Boston, including a lithographed portrait of the builder and a sketch of "The Great Republic." Mr. Carl Streifford's fine model of McKay's most famous clipper, the "Flying Cloud," built to a scale of 3/32" to the foot, is on exhibit.

There is also shown a number of scarce prints, water colors and oil paintings of the U. S. S. "Constitution," as well as Col. Wm. F. Spicer's model of this well-known ship. Much interest is being centered around this old ship owing to the decision reached by experts that the "Constitution" is in such bad shape that it must either be extensively repaired, which would cost considerable money (not forthcoming at present), or it must be destroyed.

Mr. Clarence M. Willis, of San Francisco, was in New York, with Mrs. Willis, this month. He dropped in to see us and have a chat about his hobby. He has completed half a dozen different models in the past 10 years, but the last two years has had very little time, except occasionally at night, to devote to this pastime. When he does, his wife generally ac-

companies him with her book and sits and reads, as she too is quite interested in model work and likes to see him at his work. His latest effort is one of the American Locomotive Co. Model Locomotives, but he has been obliged to side track it as the manufacturer has not completed all the patterns yet. Mr. Willis is now on the lookout for a complete set of Loco. castings to take up and is considering a P. R. R. K. 4 S. ½" gauge. He also mentioned that he would like to see a Model Engineers Club started in San Francisco. Here is a grand opportunity for our Californian enthusiasts to get together and start something. Mr. Willis is Manager of the Frisco Manufacturing Co., Inc., 244 Eddy Street, San Francisco, and he would like to hear from any Modelmakers in his locality.

NEW BOOKS

Practical Lessons in Metal Turning and Screw Cutting, by Percival Marshall, revised edition, 218 pages, 220 illus., 7¼ x 5 in., limp cloth, price $1.25.

In preparing a new edition of this work the Author has endeavored to add to the usefulness of this book by increasing the number of photographs of work in progress, by including a new chapter on the parts of a lathe for the benefit of those who are making their first acquaintance with the "king of tools" and by helpful additions to the text in various places. As over 20,000 copies of this book have already been sold, the man who has not purchased a copy, will realize that he ought to have it at once.

The Art of Rigging, by Capt. George Biddlecombe, R.N., with an introduction by Capt. E. H. Pentecost, R.N.R., XV 153 pages, 17 page plates, 9¾ x 6¼ in., cloth, $5.00.

This well known work on the art of rigging sailing ships, originally compiled as a text book for a Naval Academy, has been reprinted to meet a growing demand from builders of models of old time sailing vessels. The work is divided into five parts, 1. Explanation of terms and phrases used, 2. Directions for the preparation of riging, 3. Progressive method of rigging, where to begin, etc., 4. The running gear, rigging of yachts and small vessels, 5. Tables of the quantities and dimensions of the standing and running rigging. The model boat builder will find in this work much information that will prove of value to him in the planning out and rigging of his models. The illustrations are very clear. This is without question the best book on the subject.

Modelmaking, by Raymond Francis Yates, second edition, revised and enlarged, 428 pages, 338 illus. and drawings, 9 x 5¾ in., cloth, $3.00.

A practical treatise for the Modelmaker and professional mechanic, giving instructions on the various processes and operations involved in modelmaking, and the actual construction of numerous models, including steam engines and boilers, model power boats, locomotives, electric cars, etc., including lathe work and pattern making, electroplating, soft and hard soldering, grinding and drilling,

shop equipment for Modelmakers. The work is of exceptional value to Modelmakers not only from its practical and useful information, but from the fact that it describes a number of models that have been built and operated successfully. It should be in the bookcase of every model enthusiast.

CORRESPONDENCE

The Modelmaker,
Gentlemen:

I want to commend you on that article in Modelmaker for May under Foreword. It says a lot in a few words, in regards to the game, especially in getting service on parts and castings. It hit me at the right time, as I was just wondering about an order I had placed with a certain firm on the 26th of March, but have not heard from, for castings I was very much in need of. This is one thing that holds up the game. A fellow feels more like going to the trouble and time to make up his own supplies than to order them out and then wait a year to get them. So you can figure that there will be a good many readers of Modelmaker who see that article, who will second it with me. I want to say that I had the pleasure of calling on Mr. Crane, at Canton, Ohio, recently and he certainly is some mechanic, and has some of the finest working models that it is my pleasure to look on. We have struck up a friendship that I know will be profitable to us both. Well here to success for Modelmaker.

J. W. NEPTUNE,
130 Paul Court Akron, O.

FOR SALE

Patterns—Wood and Metal, Models and Small Castings. Special attention to modelmakers wants. J. H. Koch, 103 Summit Ave., Linwood, Pa.

Blue Prints of Ships for Modelmakers, send for circular. G. B. Douglas, 165 Summit Ave., Upper Montclair, N. J.

Morgan 20 Ft. Glider. I can supply the necessary materials to build your own. Icken, Morsemere, New Jersey.

Model Engineer, Back Vols., bound and in Numbers, Spon, 120 Liberty St., New York.

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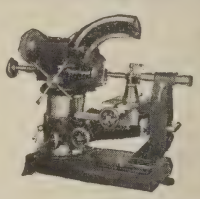

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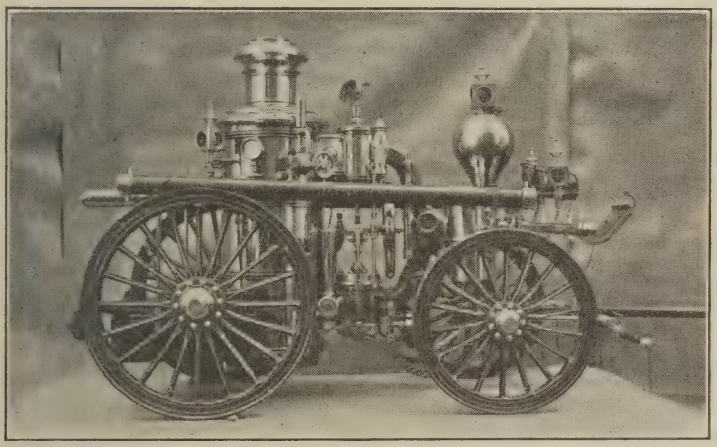

MR. F. A. WARDLAW'S AMOSKEAG STEAM FIRE ENGINE

Awarded a Silver Medal at the Society of Model and Experimental Engineers' Exhibition at London, October, 1913.

THE MODELMAKER

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OUR FOREWORD

The contents of the first twelve numbers of The Modelmaker have mainly consisted of articles on locomotives, cars, marine engines, stationary and gas engines, boats, model yachting, notes and races.

It is not our intention to confine ourselves to only these subjects. We would like to include some articles on the construction of model aeroplanes as we believe this is one of the coming subjects of great interest to some of our readers. We would like to receive descriptions and drawings of the models several of our readers have recently built, with full particulars of their construction.

Aeronautics is a very live subject to most of the foreign countries, and although the U. S. has not kept up with its competitors, we believe the time is not far distant when the industry will make great strides in this country.

France, England and Italy have national laws regulating the operation of aeroplanes, and these laws have helped greatly to stabilize the industry. Until the U. S. creates a Federal Board and makes suitable laws for its guidance, the commercial development of aeronautics will be retarded.

There are a number of private firms in the U. S. working quietly on the development of passenger and freight carrying aeroplanes, and in this work the scientifically constructed model will have its place.

We shall be glad to hear from any reader on this subject.

Mr. H. A. Brubeck is at work on a Pullman Sleeper of the latest type. The model is ½" scale, 2½" gauge, with state rooms, lavatories, berths with all the regular fittings, and illuminated with electric lights. The under frame is of steel; sides of the car of wood with lines of rivet heads to give it the appearance of an all-steel car. Two six-wheel trucks with wheels 1½" diam. corresponding to the standard 36" wheels, dummy leaf springs, working spiral springs, real journal boxes with flap lids. Length of car 41" overall; height from rail to top, 7"; width of car, 5"; weight approximately 25 lbs.

Mr. Frank Birch writes us he has made quite some changes to his ½" scale 4—4—2 Atlantic, which improves the general appearance and efficiency of the model very much. He has a ½" scale Pacific, also an O gauge Pacific under construction, and will let us have some more particulars of these two models later on.

STEAM FIRE ENGINE

Mr. F. A. Wardlaw

I am enclosing you a photo of the Amoskeag Steam Fire Engine I built in London, 1912-13. It took first prize at the M. E. Exhibition of October, 1913. Built mostly from memory as I had no drawings, only a photo of the prototype, and had not seen the original nor one like it since 1885. It used to be in service at New Brighton, Staten Island.

The principal dimensions of my model are:

Length about 18".

Width over wheel hubs, 9½".

Height to top of chimney, 12½".

Boiler—12⅜" copper tubes. Firebox 3" dia. at grate, 2½" at lower tube sheet. Tested to 200 lbs., but safety valve is set to blow off at 80 lbs. Lagged and covered with polished German Silver Gun Metal bands. Steam gauge to 100 lbs. Boiler fed by two pumps—one on each end of slide link (or crosshead).

Engine—Steam cylinder, 15/16" x1⅛". Main pump 9/16"x1⅛"; 8 valves; double acting.

With steam pressure of 55 lbs., burning cannel coal, has lifted water vertically nearly 4 ft. and thrown a stream a distance of 46 ft.

Mr. William H. Shupe, 372 14th Ave., Columbus, Ohio, is very much interested in model building, and if there are any of our readers who reside within a reasonable distance of his home, he would like very much to get into correspondence with them, with the object of having an occasional gathering of those interested in modelwork.

Mr. Frank Coffman, of Silverton, Oregon, writes he would like to get in touch with any Modelmakers or anyone interested in this hobby who are located in his section of the country. Please drop this gentleman a line, giving him your address.

A Model Yacht Regatta was recently run off on the Conservatory Lake, Central Park, New York, under the auspices of the Bureau of Recreation, Department of Parks. There were so many entries in the first four classes that each class had to be run in heats. Six cups were presented by Dr. Wolbarst, Mr. Victor Bidder, and Boucher, Inc., for the first places, and twelve medals donated by "The Graphic" for second and third places.

"15" Class"—1st, J. F. Vogel; 2nd, E. Tesar; 3rd, E. Krulish.

"25" Class"—1st, F. W. Nesbit; 2nd, R. Fredericks; 3rd, Florence Poth.

"35" Class"—1st, H. Adam; 2nd, R. Werner; 3rd, B. Gabraber.

"50" Class"—1st, T. Owens, Jr.; 2nd, Harriet Schwartz; 3rd, H. Werner.

"72" Class"—1st, E. Olson; 2nd, E. Webb; 3rd, H. Hastava.

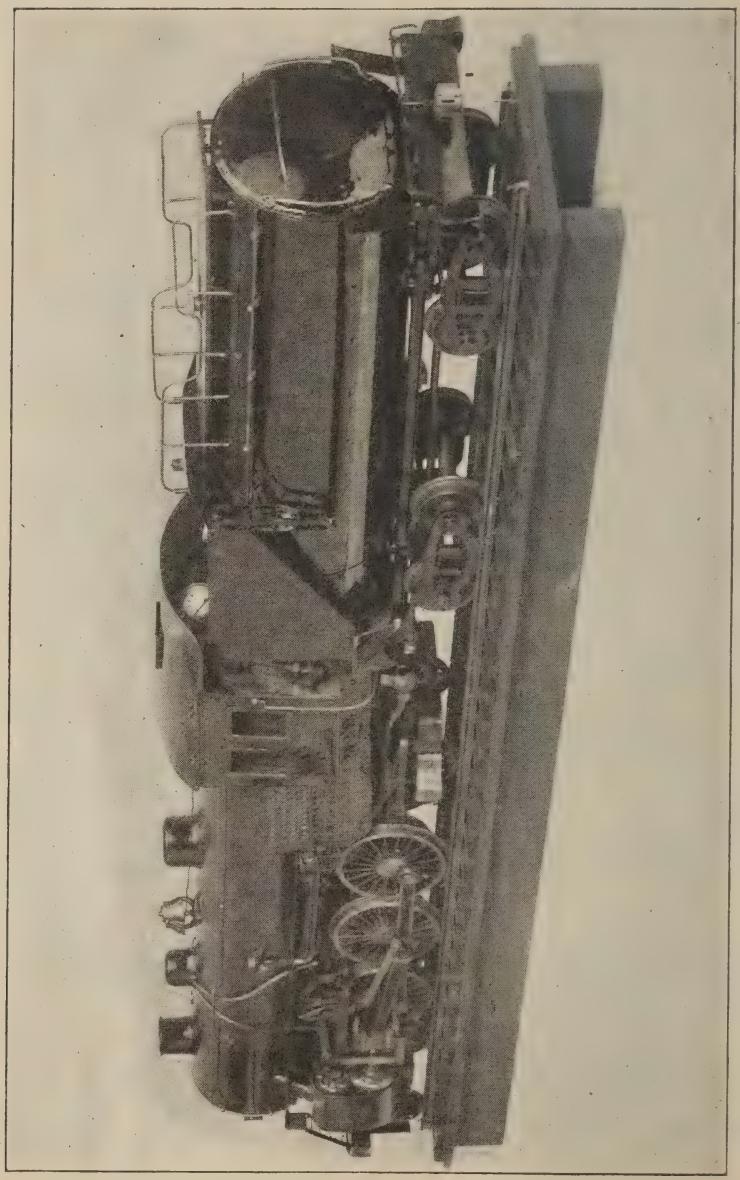
Power Boats—1st, H. Florato; 2nd, S. Bostwick; 3rd, D. Bostwick.

There were six entries for the "72" Class," which was the most exciting of the meet.

The contestants were all boys and girls. Most of the boats were designed and built by parents and relatives.

A large crowd of spectators were present.

It is to be hoped that this is only a beginning, and that the popularity of this interesting pastime will increase year by year.



A 4–6–2 PACIFIC TYPE LOCOMOTIVE

2½" Gauge—Original Design

By G. A. DIEHL

This engine was designed by me with outside appearance as first consideration.

The locomotive as originally built had the regular type tender and was later changed to one of the Vanderbilt type. I think the change helped the appearance in many ways.

The cylinders are built up according to my method as described in the May issue of this magazine. Likewise the domes and front end were made as described in the same article. The entire locomotive, with the exception of the wheels, pistons and cylinder heads was made by hand on a small table with such tools as files, hand drills, a few taps and dies and a soldering torch. The boiler is a 3 in. steel flue tube of 12 Ga. which was ripped down the center on only one side for a distance equal to the firebox and straightened out. This formed the outsides of the firebox. The crown sheet was made of 14 Ga. copper with three stays in each side and three roof stays all of which were ⅛ in. steel copper coated. There are five ½ in. copper flues each 10 in. long. The firebox is 2 in. high by 2 in. wide at the grate by 4½ in. long. The entire boiler is brased and was given a hydrostatic test of 250 lbs. cold water.

The boiler casing is made of Russian iron left unpainted all except the smokebox portion. The portion that covers the firebox has 1/16 in. escutcheon pins riveted in rows to represent stay bolts. There is ⅛ in. of asbestos lagging over the firebox and for a distdistance of one inch from the front end, the rest being air space. I find that air will conduct less heat to the outside than solid asbestos will.

The cab roof is made to hinge up. I have placed an electric light in the cab and one in the headlight.

The fuel is gasoline, which is carried in the front compartment of the tender. The tender carries one quart of gasoline and two quarts of water. The burner is a development of my own and it is better than anything else I have ever tried. The burner is almost entirely silent and I can turn the fire down to only a ¼ in. flame or I can turn it on full blast. No induced draft is necessary even

in starting. The temperature of the smokebox gases is extremely low showing that the boiler absorbs almost every heat unit. I will describe my experiences with liquid and solid fuels at length later.

The tender is made of a 4 in. copper tube of 14 Ga. 13 in. long. The front head and division plates are 14 Ga. brass flanged, riveted and soldered in place. In the water compartment is placed a hand water pump with a 3/8 in. bore and 2½ in. stroke. There are two check valves in the water line, one on the boiler and the other between the engine and tender.

The valve gear is full Walschaert. The bell is a complete working model in itself, and the lubricator is of the displacement type. The steam pressure is normally carried at 90 lbs. and the safety valve is set to blow at 100 lbs.

The boiler fittings are as follows: safety valve, whistle, water glass and try cock, blow off, steam gauge 0-120 lbs. per sq. in., two check valves and a displacement lubricator.

Automatic couplers are fitted to front and rear of the locomotive. There are 25 castings in all, 20 of which are the wheels.

The following are the principal dimensions and data:

Service	Passenger
Rated tractive effort	10 lbs.
Weight on drivers	25 lbs.
Total weight in working order	40 lbs.
Diameter of drive wheels	3 ins.
Diameter of pilot wheels	1 in.
Diameter of trailer wheels	1¼ in.
Diameter of tender wheels	1½ in.
Rigid wheel base	6 ins.
Engine wheel base	20 ins.
Total wheel base	35 ins.
Length over buffer beams	38 ins.
Heating surface, flues	75 sq. ins.
Heating surface, firebox	42 sq. ins.
Heating surface, superheater	18 sq. ins.
Heating service	Total, 135 sq. ins.
Grate area	17 sq. ins.
Height over all	6⅞ ins.
Width over all	5 ins.
Fuel	Gasoline
Electric head and cab lights	
Tender capacity	Fuel, 1 qt.; water 2 qt.
Tender	Vanderbilt type

CYLINDER DATA

Bore ..... ¾ in.
Stroke ..... 1 in.
Valves .....Piston
Diameter .....7/16 in.
Stroke ..... ¼ in.
Valve gear .....Walschaert
Inside admission.

Two years spare time were required to build this model, and only one drawing was used which was a valve motion drawing.

The engine runs at a very high speed when running alone. The fire maintains any pressure I wish. It will keep 90 lbs. pressure in the boiler when the engine is running at full speed. As I have stated before the engine was designed primarily for appearance, but its operation is far better than I had expected, so I prize it very much.

DYNAMIC OPERATION OF A LOCOMOTIVE

The dynamic operation of a locomotive steam engine is accomplished by four essential acts; steam admission, expansion, exhaust and compression.

Admission

Admission is the act of directing steam pressure against a piston. It is the motive agent employed for revolving the wheels. The duration of the admission period must be subject to control by the locomotive engineer. At his option it should be possible to admit steam to the cylinders during nearly the entire piston stroke in order to insure positive starting reliability and maximum power for initial train movement. The maximum cut-off must therefore be late.

After starting a train it must then be possible to manually shorten cut-offs (the admission period), because less power is required to keep a train moving than is necessary to start and accelerate it, and because also, small volumes of steam must be used on

account of difficulty of rapid exhaust after speeds become considerable, and further because it is impracticable to design locomotives with proper ratios between boiler capacity and cylinder volume to permit the use of full cylinder capacity only at low speeds. In addition, late cut-offs are uneconomical since they preclude effective expansion.

The range of duty required by a locomotive in starting, accelerating, attaining and maintaining high speed, is so great that it necessitates a wide range of cut-offs subject to control by an engine driver.

The admission period must begin as early as the beginning of a piston stroke. It may, and usually does begin before the completion of the piston's return stroke and that portion of its period is called pre-admission. Steam is then admitted against a piston tending to check movement and cushion its momentum. The pre-admission period should not commence before the crank pin is practically on a dead center when working in late cut-offs and consequently slow speed. But it may, and it is desirable that it should begin considerably earlier when in early cut-offs (high speed position), because piston velocity is then greater and greater cushioning power needed to absorb the shock of checking and reversing the direction of piston movement.

It is desirable that during the admission period steam flow should be unobstructed in order that there may be but little drop in pressure against a piston up to the point of cut-off.

Any valve actuating mechanism tending to increase the widths of steam port openings is therefore for that purpose basicly sound.

Expansion

Expansion is the act of prolonging steam pressure against a piston after admission ceases. A mass of steam then in a cylinder cut off from further replenishment from a boiler, continues to expand and propel a piston with decreasing pressure until it is permitted to escape to the atmosphere. All piston movement during this process causes rotative impulse to the driving wheels without further drain on a boiler and is in the direction of fuel economy. The expansion period should, therefore, embrace the greatest practicable portion of piston movement. In all successful valve gears the relative duration of the expansion period increases the shortened cut-offs.

Expansion should be continued as late in the stroke as possible, and any valve gear that permits this, is in this respect desirable,

provided it does not introduce objectionable features affecting other events in the cycle.

Exhaust

Exhaust is the act of relieving a cylinder of pressure. Its period may be divided into two stages. First, after expansion has been carried as late in the stroke as practicable, all steam tending to propel a piston should be permitted to escape to the atmosphere. Unobstructed means should be provided for escape to the lowest obtainable pressure by the time a piston has reached the end of a stroke so as to insure the least possible initial back pressure during the return stroke. This is particularly desirable at high speed, because it is not only then more difficult to accomplish, but the piston speed is then so great that it precludes material lowering of back pressure ahead of the advancing piston during this, the second exhaust stage.

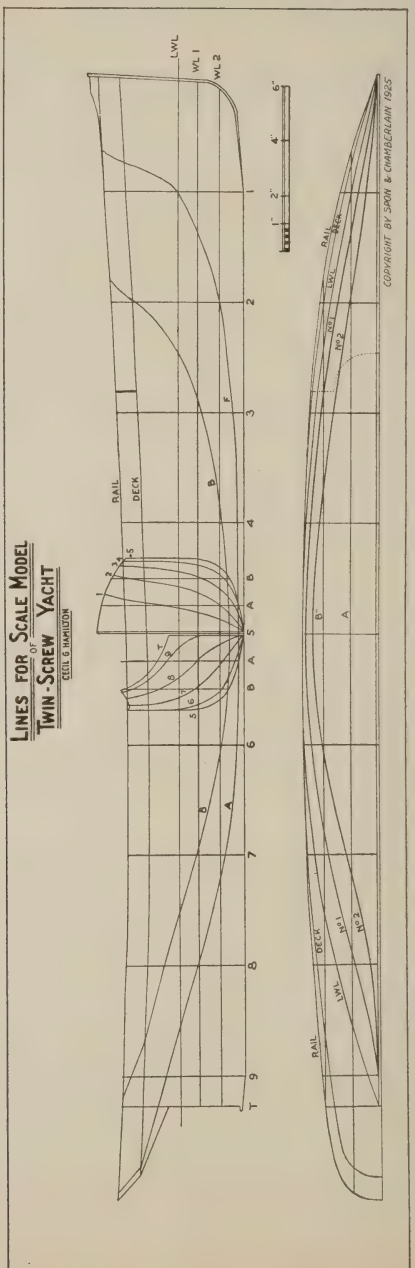
A valve gear, therefore, that causes rapid valve opening during the first exhaust stage, and maintains liberal opening during the second stage, not only increases effective cylinder pressure, but the increased power is produced economically because of lower negative pressure.

Compression

Compression is the act of building up pressure to cushion a piston at the end of its stroke. Compression together with pre-admission serve to fill the clearance space between the piston when at either extreme position its nearest cylinder head and valve. These together insure high initial pressure.

All steam pressure remaining in a cylinder at the beginning of compression, together with 15 lbs. atmospheric pressure, are concentrated into smaller space and should then approximate steam chest pressure. Compression and pre-admission blend into a common pressure. Compression costs only to the extent that it retards wheel revolution. Pre-admission costs in addition the amount of steam it draws from a boiler. Therefore, the terminal pressure should be largely caused by compression. That is, terminal compression should be so high that it will require but little if any additional pressure from pre-admission to build up a pressure equal to that in a steam chest. Compression should and does in all successful valve gears begin earlier at high speed (in short cut-offs) that allow speeds. But at low speed terminal compression is lower and the influence of pre-admission more pronounced and expensive.

At high speed it is difficult to avoid excessive compression, and any valve gear tending to lower initial compression logically accomplishes some economy.


LINES FOR SCALE MODEL OF TWIN-SCREW YACHT
CECIL G HAMILTON
LWL
WL 1
WL 2
RAIL
DECK
BASAB
1" 2" 4" 6"
No 1
No 2
No 3
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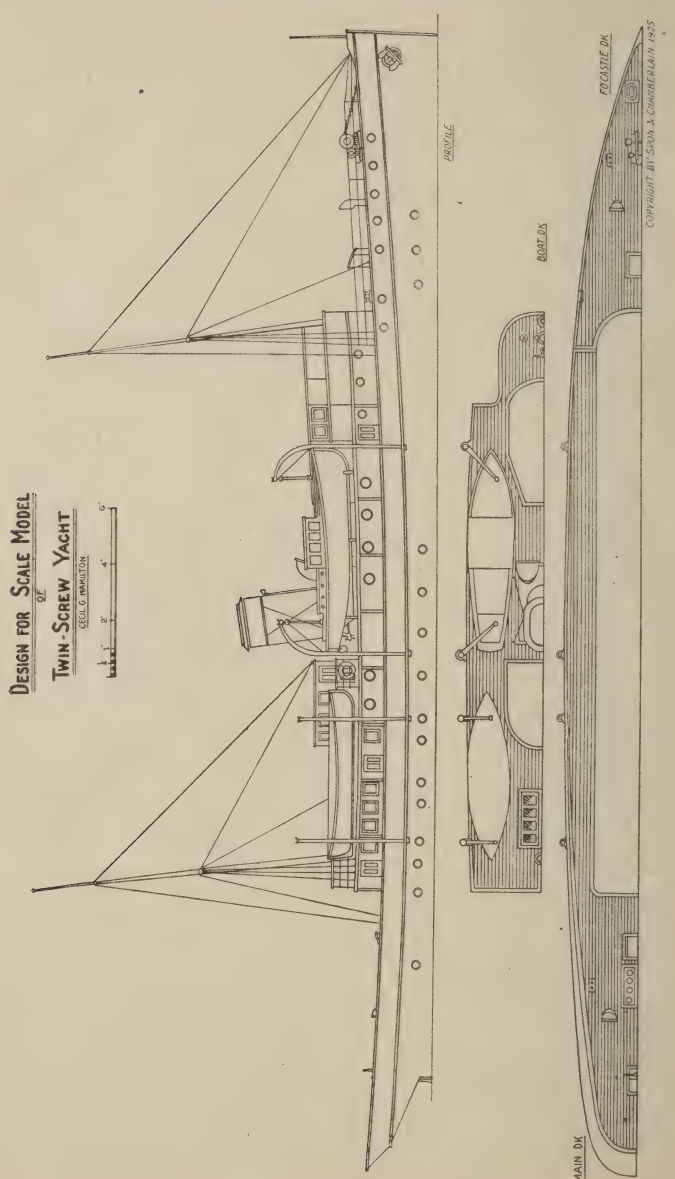
MODEL SHIPBUILDING NOTES

A Design for a Scale Model Twin-Screw Yacht

By CECIL G. HAMILTON

The prototype selected for this design is a handsome twin-screw vessel built for Mr. F. W. Vanderbilt. She has quite a few novel features, having a straight stem, and an unbroken sweep in the sheer from bow to stern, also two pole masts and a naval type funnel. The model is 40.5 in. overall, and 39 in. on the L. W. L., with a beam of 5.5 in. and a draft of 2.375 in. All of the chief characteristics have been retained in the model, and care has been taken to arrange the various deck-houses, fittings, etc., so that they do not appear out of place or proportion. It will be seen from the profile, that the fo'castle deck terminates just aft of the foremost, where it meets the main deck, this deck being ¾ in. lower. Instead of having wire rails around the main deck, there is a bulwark fitted, with a wood rail all round. On the main deck, from the foremast to 2½ in. aft of No. 7 section, is situated the main saloon. The forend of this saloon has round sidelights, while the after end has square windows. Over the saloon, for its entire length, and the full breadth of the main deck is the boat deck. On this deck the ship's boats are stowed, two small lifeboats being fitted at the after end, while at the forend a large lifeboat and a motor boat are fixed. The foremast is fitted at the front of the boat deck, and just aft of the mast is the chart house and wireless room, while at each side is a covered shelter for the watch and the port and starboard lights are secured to this shelter. In front of the chart house is the wheel, compass, and engine-room, telegraph, with a cover over them. Aft of the wireless room is placed the funnel casing with two vents, and the funnel on it, while aft of this again is placed the smoke-room, and a skylight with eight square windows, then the aftermast. Rails are fitted round the afterend of the deck, and at the sides, between the boats, while the foreend has a bulwark, with a wood hand-rail. The davits are of the ordinary ball-headed type, placed in sockets attached to the ship's side, a light type being


DESIGN FOR SCALE MODEL
OF
TWIN-SCREW YACHT
CECIL G. HAMILTON
PROFILE
BOAT DK
FO'CASTLE DK
MAIN DK
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used for the small boats, while a more substantial type is used for the motor boat and the large lifeboat, all of the davits being fitted with the usual blocks and falls. The funnel is of oval shape with a naval type lip around it, and the eyes are used for the stays; there is also a dummy siren. The masts are pole type, with a headlight on each, and the rigging is cut to the minimum, thus avoiding a clumsy appearance. On the foredeck is the windlass, with which to handle the anchors, and these being stockless are stowed in hawse pipes, the chains being led over the drums into the lockers. This deck also has two vents, a companion-way and the usual fairheads and bollards; wire rails and a flagpole complete this deck. The main deck, aft of the saloon, has a companion-way, a skylight with eight square windows, two vents, and bollards and fairheads. Above the rudder stock is fitted a square box (with removable cover), and at the foreend of this box is fitted a dummy wheel. All decks are clear varnished, and then lined out with Chinese ink; this is to resemble deck planking. The stern-tubes are carried right from the engine to the shaft-brackets, these brackets forming a water-tight joint. (Note: This type of shaft-bracket will be described in full later on.) The propellers are brass, three bladed, 1½ in. diameter and can be built or purchased, as the builder desires. The color scheme is the same as the prototype, the underwater body being green with white top sides, while the saloon, davits and boats are also white. The funnel and the two vents are buff color, while the funnel has the lip painted black. Round the main deck, outside, is drawn a fine gold line. The chart-house, wireless room and smoke room are mahogany, varnished, and all the fittings are silverplated. No detail drawings of the fittings, masts funnel, etc., are given, as in later articles it is intended to give drawings and detailed description of these important parts.

Mr. F. G. Carter writes he has been working in his spare time during the past two years on a Model 1¼" gauge Pacific and has it almost completed. His main obstacle seems to have been the lack of a suitable lathe, a good equipment of tools, and the difficulty he had in getting the kind of material suitable for his work, most of which he had to import from England. In spite of these drawbacks he seems to have accomplished good results. The Loco. runs well under a head of only 5 lbs. of steam.

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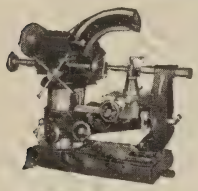

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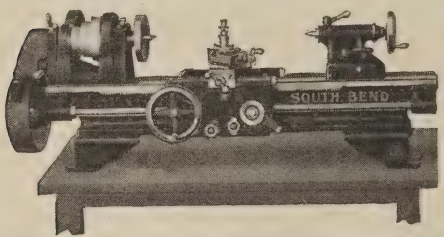

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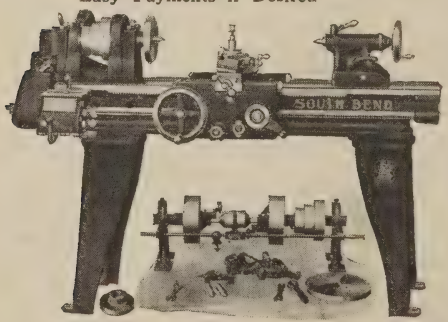

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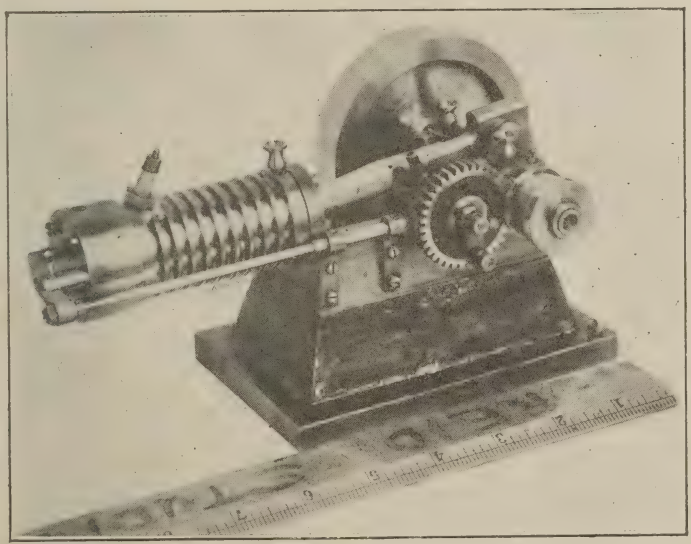

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OUR FOREWORD

With the passing of the summer months the Modelmaker's thoughts will be turning once more to the approaching winter with its long dark evenings, and one question that will occur to him is what he will take up for his indoor recreation.

Has he some partly finished model that was put upon the shelf because some obstacles to its completion seemed too much for him. If so take it down off that shelf and dust it over. Get out your drawings and go over them carefully. You will approach your problem with a refreshed mind and what may have seemed an unsurmountable obstacle may prove to be some slight miscalculation in your measurements or a mistake in workmanship that can be easily remedied. Take the model apart and go carefully over each piece, some may be improved by a little more filing, or turning. As you reassemble the parts and realize how much you have already accomplished you will feel a new enthusiasm and a desire to complete the work. Then you will have the real joy of seeing the work of your own hand, operating successfully.

In the intense nerve racking life of the city worker, especially those who are called upon to use their mental faculties, an antidote is necessary. We will call it "Hobby" in its most generic sense, because its activities are legion.

We are mainly interested in that section which may be classified as Model Making or Model Engineering.

This does not necessarily mean the construction of a locomotive, or an intricate piece of machinery. It may be the reproduction, in miniature, of some mechanical contrivance, a sail boat, aeroplane, automobile, docks, steam engine, gas engine, dynamo, some piece of electrical apparatus, a model theatre, telescope, moving picture machine, lathe, or toolmaking. Each object has its problems to solve as well as its educational and recreative value.

A hobby is really a governor, or balance wheel, something that is necessary if we want to live a well regulated life. There are far too many insane asylums in the United States with their thousands of inmates, costing the country a very large sum of money for their yearly maintenance. If some of that money could be used to educate our boys and girls to devote some of their spare time to the cultivation of a "Hobby" fewer such institutions would be required

because there would be fewer inmates.

Coming back to our particular interests may we ask our readers this question, "What are you going to make this winter?" If you haven't any particular objective, look over the back numbers of the Modelmaker and read the descriptions of models that other fellows have made. This may give you an idea. If you are a beginner do not be too ambitious. Select some comparatively simple job. Give it thought, time and patience and the best that is in you, and when the job is finished you will feel better able to tackle a more complicated piece of work. Do not start more than one job at a time, finish one first.

Always remember this "Hobby" is not a "task," it is some form of recreation from which you are going to derive pleasure and enjoyment, something that is going to dispel for a time your daily worries and anxieties and make you more fit to cope with them on the 'morrow.

The question of material and equipment will arise. Get in touch with our advertisers and find out what they have to offer. Should none of them have what you require write them explaining the work you have in mind and see if they cannot help you out.

Lastly, we would strongly recommend that every reader join up with some Model Makers club, if there is one within easy reach of your home. If not try and find some kindred spirit with whom you can talk over your aims and ambitions.

If there is anything we can do to help you do not hesitate to write to the Modelmaker. We are at your service and always glad to be of any assistance.

The members of the Canadian Model Engineering Club are hard at work preparing a number of exhibits for their Stand at the Canadian National Exhibition which will take place shortly, in Toronto. Their Exhibit of Models at this Exhibition last year was one of the greatest attractions in Machinery Hall. This year The C. M. E. C. expect to have a much larger and finer collections of models than they showed in 1924. This is a real live organization and it has gained considerably in membership during the past year. Their headquarters are at 122 Pacific Ave., Toronto. There is also a branch in Montreal in charge of Mr. F. O. Lewis, 139 Dobie Ave., Mount Royal, Montreal. The Modelmaker has a good many supporters in Canada and we would suggest that every one of them get in touch with the Secretary in Toronto, or, if more convenient for them, with Mr. Lewis in Montreal, and find out all about their work and the dates of their meetings. The individual can gain much by coming in contact with such enthusiasts as comprise the C. M. E. C. and the Club is always glad to welcome new men who may ultimately become members and who in their turn will help still further to increase the number of enthusiasts interested in this most fascinating pastime.

Mr. Waler Boden, 109 Miller St., Mt. Clemens, Mich. is very much interested in Modelmaking. He would like to get in touch with any of our readers in his locality.

A MODELMAKER'S LATHE

By LOUIS B. GEROLD

A good bench lathe is the birthright of every Craftsman and Modelmaker. The lathe was the first machine employed by man and still holds premier place for the working of metal, wood and almost all kinds of materials. All other machine tools are but adaptations of the lathe to suit special requirements.

Lathe work is as interesting as it is instructive and appeals more than any other type of manual work as it combines the work and the play elements. A feeling of satisfaction follows when a man shapes iron, steel, brass, wood, etc. into various useful and ornamental forms.

Lathe work helps to stimulate the inventive faculties and gives expression to ideas; it trains the mind to plan and reason out in advance of action and it develops originality, precision and orderly processes of thought.

For the man with a hobby a lathe is unsurpassed. There are thousands of men in all walks of life who go to their lathe for relaxation and to turn out their ideas while still fresh in the mind.

With the lathe the Modelmaker can do turning, facing, boring, winding, drilling, thread cutting—a range of operations which covers the whole field of machine work.

There are a number of good bench lathes on the market which have their particular appeals to the individual but, in the final analysis it should be remembered that a lathe is a tool to transfer its own character to other things and it is therefore of paramount importance to have the lathe of good materials, workmanship and design. If any of these fundamental conditions are wanting then imperfection in the produce will follow as a matter of course.

The essential requirements in a good bench lathe can best be summed up in the following way:

1.—Good spindle running truly in good bearings.

2.—Substantial Toolpost solidly holding the cutting tool.

3.—Straight line of guidance for the tool.

4.—Alignment of centers.

5.—Method of construction and fastening together of the component parts to obtain the greatest rigidity.

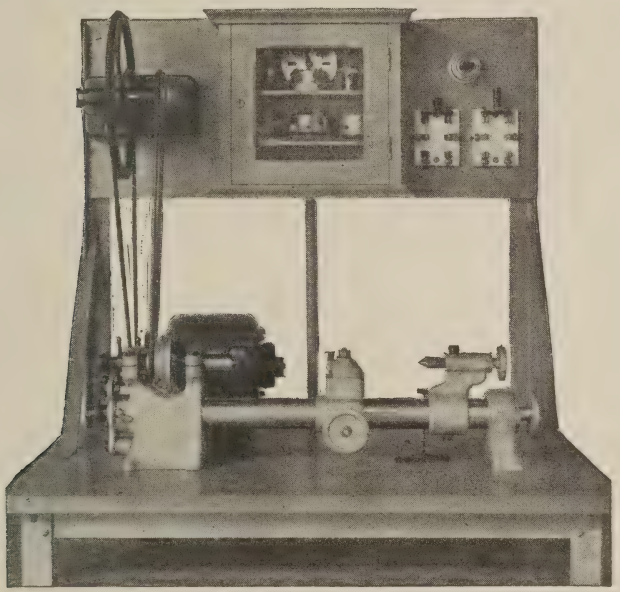
6.—Liberal bearing surfaces.

7.—Means of taking up wear.

8.—Suitable materials.

9.—Good workmanship.

It is necessary to remember that the lathe has to impart form to very resisting materials so that sturdiness and rigidity are essential for good performance.



In the interest of our readers we hope to give a series of articles on bench lathes suitable for the modelmaker so that he can make comparisons and choose such a tool as he considers suitable for his purposes. We must ask our readers, to whom some, or perhaps most, of the following hints sound too elementary, to remember that there are many intending purchasers of lathes to whom the most elementary information will be of value.

For the man who is limited financially or who does not care to spend a big sum for a lathe but who wants a real, accurate slide-rest tool which will do all his work, the lathe shown on the accompanying illustration offers an excellent opportunity.

The bed is hollow and is made from solid drawn mild steel tube, ground true 1¾" outside diameter, wall thickness 3/16". This type of bed provides a strong form of construction and is not liable to distortion.

The Headstock is very massive, the spindle bearings being of babbit metal of exceptionally hard wearing qualities and adjustable for taking up wear. Oil cups for lubrication of the spindle are provided.

The spindle is made of mild steel, cut from the solid. Its extra length enables the Gear Wheels to be easily changed and held truly concentric. The cone pulley is bushed with gun metal.

The back gears, having an approximate ratio of 5 to 1 are made of mild steel, cut from the solid, pressed and pinned to a mild steel hub running on a phosphor bronze eccentric shaft. They are held in engagement by a ball ended pin, and are easily thrown in and out of gear.

The change wheels number 13. They are 28 diametral pitch and cut all threads, right or left hand, from 6 to 60 T. P. I. They are made of mild steel, machine cut from the solid, and are 5/16" wide. The quadrant is easily adjusted and is rigidly held when in use. The sleeves for the change wheels, used when compounding or for the idler gear, are made of gun metal in order to minimize any tendency to seize.

The clutch, of mild steel, is simple and protected from chips and dirt. It is bushed throughout with gun metal, and gives a perfectly balanced drive to the leadscrew.

The leadscrew pitch is 12 T. P. I. It is protected inside the bed from damage and chips and is supported by ample bearings; at the rear end running in a gun metal bush, and at the headstock end in a triple white metal thrust and journal bearing.

The slide-rest has a longitudinal traverse along the entire length of the bed and a cross feed also. When fed by hand the large wheel at the tailstock end provides the motion on the slide rest. Besides a power motion on the slide-rest while cutting threads and when the clutch is in engagement, it is possible to use the slide-rest with automatic feed for ordinary turning jobs by using the series of gears for fine threads.

The tool holder is massive and of rigid construction. The tool is held solidly in place by means of two bolts, and the tool holder can be swivelled to any desired angle, the large and accessible nut firmly clamping it into place.

The lathe will take work up to 4" in diameter and 12" in length. There are some twenty different accessories and attachments for various kinds of work but the space required for their description is not available at this writing. Amongst others there is a 2½" 3-jaw Lever Scroll Chuck, 3" 4-jaw Independent chuck, face plate, driving dogs, drill center and drill chuck, steady rest, taper turning attachment, hand rests, woodworking chucks, drill pad and several other items.

Drive is by ¼ H.P. electric motor or foot treadle. The accompanying illustration gives some idea of the adaptability of the lathe to fit itself into any shop or space, no matter how small. In fact the illustration shows a set up on a simple home-made bench which can actually be carried from place to place as the motor cord can be plugged into any regular light socket.

The Model Engineer for July which commences Vol. 53 contains the following important articles: Design and Construction of a Miniature Radial Drilling Machine; Ornamental Lathe Work; A Sensitive Drilling Machine; Design and Construction of Small Petrol Engines; Clock Repair Work; Pumps for Flash Steam Craft; Biographies of Modelmakers; Loco Prototypes; Light Engineering Equipment; Some Ornamental Lathe Work; Walschaerts Gear; Feather Planes; Shop Shed and Road; Recent Inventions; Practical Letters; Queries and Replies; Model Marine Notes.

The Model Railway News, principal contents in the June and July issues: Rev. H. A. Turner's O. O. Gauge Railway System; Model G. W. R. Locomotive Coaling Stage; Large 2 in. Gauge Model Railway with the Main Station Yard Showing Nineteen Parallel Tracks; Design for a 2½ in. Gauge Baltic Tank Locomotive; Mr. C. E. Howie's Gauge 1 Railway System; O. O. Gauge Rolling Stock; 1¾ in. Gauge Electric Locomotive; Model Connel-Type Cantilever Bridge; Monthly Notes; Queries and Replies; Our Mail Bag, etc. If you have not already placed your subscription for this magazine, write to Spon & Chamberlain.

Mr. J. W. C. Corbusier, has sent us some photos of two of his models. A 4—6—2 New York Central Loco. and a photo of a model of The S. S. Acquitania, A Cunarder. Both of these are very fine examples of model work and we hope later on to give our readers more particulars about their construction.

LOCOMOTIVE VALVE GEARS

By ARTHUR CURRAN

Replying to your inquiry it would be difficult to say off hand which of the popular valve gears is most used. However, here are a few points which might help you and your readers.

First.—The Walschaert is a reliable and practically "fool-proof" gear, and has enjoyed immense popularity in this country for about twenty years. Properly designed, it is both beautiful and accurate and will give excellent results in all ordinary classes of service.

Second.—The Baker is a very fine gear and slightly easier to handle than the Walschaert. However, as many locomotive designs now include power operated reverse mechanisms, this advantage is not so important. Moreover, a royalty, is, presumely, exacted for the use of Baker gear.

Third.—The matter of "smartness" is not entirely dependent upon valve gear, though the latter must, of course, be adjusted with exactness. A short piston stroke produces greater smartness at speeds above, say 50 m.p.h., than a long one.

For example: The highly efficient Class K—3 (Pacific Type) on the New York Central has a stroke of 26 in. and has hauled such trains as the Twentieth Century, Empire State Express, and many others for about fifteen years. At 85 m.p.h. these engines run with great ease and smoothness. Walschaert gear is fitted to all of them.

On the other hand, the Pacifics used on the New Haven road have a stroke of 28 in. This of course, helps them in starting, but gives them the effect of "laboring" at 65 or 70 m.p.h.

I must admit that the stroke of 28 in. is the favorite for Pacific engines to-day; but that is due to the fact that most of the engines so designed are not normally expected to exceed 60 m.p.h. The only exceptions that I know of are the K—4 engines on the Pennsylvania and the wonderful Pacifics on the Reading. Both of the latter have enormous boilers however, and therefore tremendous steaming capacity. Neither of them have the contented purr of the New York Central K—3 at high speed; though.

Some authorities will tell you that the longer stroke is justified by the use of larger driving wheels. This is alright enough. The fact is, however, that while the standard driving wheel diameter for

fast engines on the Pennsylvania and on the Reading is 80 in., the diameter on the New York Central is 79 in., only 1 in. less. And the stroke of 28 in. is used in the South and West on Pacific engines with drivers as small as 69 in.

There seems to be no rule for this, except that many good roads now prefer to sacrifice smooth running at high speed in order to get greater power at starting.

The Atlantic which adornes my letter-head was built at Schenectady in 1901. Cyl. 21 x 26, Dr. 79 in., weight 176,000 lbs. The fine results of these engines influenced all subsequent design for fast service. The K—3 Pacific has a Cyl. Dia. of 23½ in. on account of bigger boiler with superheater. But the short stroke and same wheel dia. remain.

I think that the Walschaert gear is more characteristic of modern American practice than any other at the present time, though acknowledging the very real merits of the Baker. I may add that the design of a successful fast passenger engine involves many factors, including weight of train, profile of road and speed required. And I advocate the shortest piston stroke consistent therewith.

In this connection, I may add that the Stephenson link motion was abandoned for a number of reasons, chief among them being the following:

First—The Stephenson gear became very cumbersome as locomotives increased in size.

Second.—Its location prevented proper cross-bracing of the frames.

Third.—Its construction permitted unauthorised "tinkering" with adjustment.

Fourth.—It became inaccurate due to "lost motion."

Fifth.—It was not readily accessible.

These disadvantages were eliminated by the "outside" gears of which the Walschaert is the most prominent.

Mr. John H. Rougeau, of Orchard Knoll, Columbus, N. J., who is very much interested in modelmaking would like to hear from any one in his neighborhood who is a Modelmaking Enthusiast with a view to having an occasional meeting to talk over their hobbies and get acquainted.

Mr. Arnold Reitz, 3 Lienau Place, Jersey City, N. J. and his class of boys are building some model boats and want to get some spring motors, or small electric motors to drive them. He would like to hear from any of our readers who have done any of this work or who could supply motors.

4-CYCLE GAS ENGINE

By ADOLPH BOSSHARDT

This small model was made by my son and I without any castings except the base. Most of the work being done on our lathe using scrap material.

The cylinder was turned out of a solid piece of steel rod 1½" diam. 2¾" long, chucked in the lathe and the fluting cut out, then bored out to 1" leaving the cylinder wall ⅛" thick in the thinnest part. Both ends were then faced off true, one end being threaded for the cylinder head.

The cylinder head is turned out of a solid piece of steel and threaded to screw on the end of the cylinder.

The piston is 1" long with 2 cast iron rings with a 3/16" wrist pin ⅛" wide, brass bushing over wrist pin.

Connecting rod is cut out of a solid piece of steel, length 4¾" x1" x ⅜" with a split head bushed with bronze bearings. Connecting rod is screwed to wrist pin.

Crankshaft is cut out of a solid piece of steel length 5", width 1⅛", thickness ½".

Flywheel turned out of solid piece of steel diameter 3½", width of face ¾", weight of flywheel 1½ lbs., hub is left full thickness.

The Base is cast iron, bearings 1" wide and bushed with bronze.

There are two mushroom valves in cylinder head.

Double driving pulley on crankshaft for flat belt ⅜" wide, 1" diam., also round belt. One single cam is used for operating the exhaust valve.

The cam and timer is operated on the one gear. The gears being 2 to 1 ratio.

Handle at back of large gear wheel is for spark retard and advance.

Projection on gear wheel is insulated terminal (the timer).

An automatic intake valve is used.

Gas enters cylinder at the bottom of cylinder head.

Will run on house gas, or gasoline, if a carburetter is used.

Exhaust at top of cylinder head.

Bore 1", stroke 1½".

Length of base 5½", width 3½".

Length of engine overall 9".

Height of engine to top of flywheel 4½".
Total weight of engine 9½ lbs.
Speed 2000 R. P. M.

This model would be just the kind of a job a teacher could use in a manual training class. It would be easy for him to secure the necessary materials at a nominal cost. From the details given he could make a full sized drawing for the class to work from.

A SENSITIVE DRILLING PRESS

S. C. Swanson

Feeling the need of an accurate and sensitive drilling press that would do all the work required by a Modelmaker or an Inventor I decided to design and build one. The illustration shows the result of my work. The castings can be readily machined on a lathe having a nine-inch swing. It has an easy, accurate feed and a well balanced return motion, with a range of drill from ⅜". There are three speeds and it can be either driven by foot or power. The Vertical thrust is born by ball bearings.

Dimensions

Dia. of column, 2½".
Length of column, 15".
Dia. of spindle, ¾".
Spindle bored No. 1 morse taper.
Dia. of table, 7".
Spindle travel, 1⅞".
Drills to center of 8½" circle.

There are four sheets of blue prints giving every detail.

The machining of a set of these castings would make an excellent piece of work for the manual training class or the amateur's workshop, and when completed it would be a welcome addition to the equipment of the shop.

Mr. T. J. Dobler of Brooklyn recently made a trip to the West coast. While in San Francisco he visited the American Model Locomotive Company and had quite an interesting chat with Mr. Roy Ashley, and saw his shop. Mr. Ashley is very much interested in Model Work, not only from the standpoint of the manufacturer but also from the model maker side. His aim is to produce carefully designed and accurately made models of standard equipment, of good materials and first class workmanship, and believes it pays to put the very best into his work. He reports a very good year, and is looking forward to a much larger business this winter, because his goods are becoming better known and appreciated.

Special Offer Back Volumes of the Model Engineer. We can supply any of the following vols. in numbers: Vol. 6, Jan.-June, 1902; Vol. 7, July-Dec., 1902; Vol. 12, Jan.-June 1905; Vol. 13, July-Dec., 1905; Vol. 17, July-Dec., 1907; Vol. 23, July-Dec., 1910; Vol. 24, Jan.-June, 1911; Vol. 25, July-Dec., 1911; Vol. 27, July-Dec., 1912; Vol. 26, Jan.-June, 1912; Vol. 29, July-Dec., 1913. Price $1.75 each vol., postpaid. Spon & C. 120 Liberty St., New York.

BOOK REVIEWS

Railway Centenary — 1825-1925, 124 pages, illus. and colored plates, 11 x 8½ in., paper, $1.60.

This is an extremely interesting historical account of the development of British locomotive cars and signalling apparatus, containing a great many illustrations of locomotives, with some large colored plates. This work will make a valuable addition to the library of the model locomotive builder.

Mr. Frank Birch, of Detroit, was in New York a few days and paid us a visit. He left us a sample of his 3½" driving wheel, cast iron, for his ½" loco. A nice clean sample of good casting. He also left samples of hex headed brass bolts and a hand rail nob for boiler handrailing. He has decided to go in for the production of these in brass and iron in American Standard threads. A little later on he intends to take up the construction of model railway signals. We have frequent inquiries for such like material.

Mr. G. A. Diehl advises us that he is making a lot of model railway accessories, such as, headlights, bells, turbine generators, marker lights, automatic brake systems, cab lights, special chime whistles, coach seats, windows, ventilators and doors, and a special firing system for locomotives. All these parts will be in ½ in. scale. He hopes to give us fuller details in a later issue of The Modelmaker.

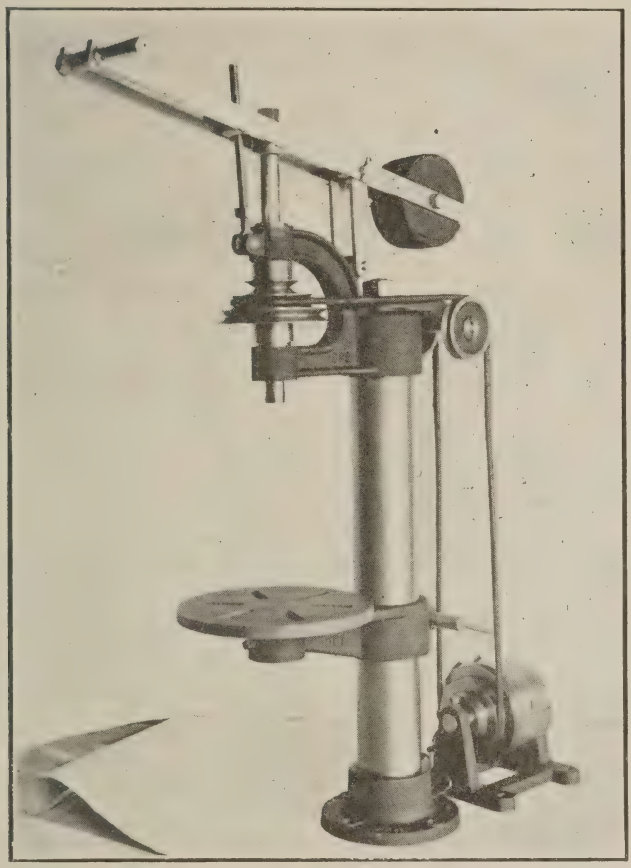
Mr. Geo. A. Cuthbertson writes us that he has been appointed Agent for the Leeds Model Company, under the name of Blanche Valley Works, Thurso, Que., Canada. They expect shortly to have catalogues and some stock of Leeds goods.

The Bathe Manufacturing Co. of Philadelphia, inform us they are making extensive alterations and improvements to their workshops. This will give them better facilities for manufacturing and handling their business which has increased very considerably in the past year. Their new illustrated Catalogue is now on the press, for which they make a charge of 25 cents.

Alfred Paul & Son, the American Agents for Stuart Turner, Ltd., have arranged with their English representatives a "Cable Service" to expedite the shipment of orders. This will no doubt save considerable time when a customer wishes to get his goods in as short a time as possible.

Hansen's News Agency, Santa Barbara, Calif. can supply The Modelmaker.

Our Canadian readers will be interested to know that copies of The Modelmaker can be obtained from the Imperial News Company Limited, 19 Bisson st., Montreal. Also the London News Company, London, Ontario, Canada, can supply The Modelmaker.



The volume entitled Railway Centenary—1825-1925 commemorating the opening of the first public railway and a souvenir of the Tenth International Railway Congress will interest model locomotive builders as it is really a history of a hundred years development in locomotive work, giving the names and dates of prominent engineers and designers and a great many illustrations of locomotives from photographs as well as some full page colored illustrations. As only a limited edition was printed all of our readers, who would like to secure a copy, should send in their order at once, to Spon & Chamberlain, before their stock is exhausted.

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Clockmakers Lathe—Similar to Goodell-Pratt No. 700. Price $18.00. Bargain. Send for details. W. C. Steuart, Modelmakers' Supplies, 2227 Callow Ave., Baltimore, Md.

Castings and Drawings, for Atlantic, or Pacific, Locomotives; Passenger coach trucks; Freight car trucks and Boiler Fittings; all ½ in. scale. Atlantic Steam Locomotive, ½ in. scale, $275.00. Photo 10 cents. Preliminary list 2 cent stamp. One-horse electric motor, direct current, new, $25.00. Frank Birch, Highland Park, Mich.

Patterns—Wood and Metal, Models and Small Castings. Special attention to modelmakers wants. J. H. Koch, 103 Summit Ave., Linwood, Pa.

Double Acting Vertical Steam Engine—⅝"x⅝" Cylinder, link reversing gear, $25.00; also a ½"x¾" Cylinder, single eccentric, $17.50. Both new and excellent for model boats. T. J. Bray, 35 Summit Ave., Jersey City, N. J.

Model Engineer Vol 27. The following are the principal articles all illustrated. Buoy's Lights and Beacons; Clock Repairing; Metal Boats; Design for Overtype Engine and Boiler; Indicator and Diagrams; Installation of a Small Electric Motor; Model Electric Locomotive 3¼ in., Gauge; ½ in. Scale L. and Y. Atlantic; Motorcycle Notes; Model Sailing Yachts, Building Rigging and Sail Making; A Steam Driven Aeroplane; Steam Motor Boat; Slow Feed Attachment for the Lathe; Petrol Driven Monoplane; Racing Schooner;; Hydraulic Models; ⅝ in. Scale Heavy Type Tank Locomotive; Additions for a 4 in. Lathe; Steam Tractor; Lens Grinding; Two-throw Feed Pump; Tool Grinder and Polisher; Speed Boat; Military Type Biplane; O Gauge Electrically Operated Railway; Three Designs for Model Speed Boats; Locomotive Notes; A Small Workshop; Power Driven Hydro-Aeroplanes; 3¾ in. Centre Home Made Lathe; 2 in. Gauge Locomotive; Two Cylinder Inclined Launch Engine; One Third h.p. Oil Engine. Notes and Queries; Shop Notes and many other short articles, 620 pages, unbound, price $2.00 postpaid. Spon, 120 Liberty St., New York.

Model Steam Boiler—Bathe Manufacturing Co. Type P complete with all fittings and alcohol lamp, slightly used but in perfect condition, prepaid $11.00. Harry J. Fromm, 424 First St., Roselle, N. J.

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Locomotive Charts, large Sectional Views numbered with a list of the parts. American Type, Atlantic Type, Consolidation Type with Walschaerts Valve Gear, Micardo, or 2-8-2 Passenger and Sleeping Car, price 25 cents each. Pacific Type or 4-6-2 size 44 X 17 in., price 50 cents. Spon & Chamberlain.

Copper Ventilators for Model boats, fine Workmanship, various sizes, $2.00 each, $3.50 per pair, insured Mail. Box 21, Modelmaker.

Postage Stamp Album containing 1200 selected stamps, and about 800 loose stamps. A fine opportunity for a beginner. $25.00. F. S. S., P. O. Box 423, Brightwaters, L. I., N. Y.

Model Engineer, Back Vols., bound and in Numbers, Spon, 120 Liberty St., New York.

Sensitive Drill Press Castings. Capacity to ⅜" drill. Can be finished complete on nine-inch swing lathe. Price $8.00 per set. Stamp for particulars. S. C. Swanson, 7826 Coles Ave., Chicago, Ill.

Euclid in Colors. The first six books of The Elements of Euclid in which colored diagrams and symbols are used instead of letters for the greater ease of learners. By Oliver Byrne, London, 1847, 268 pages, 7½ in. X 9 in., cloth with gilt edges. In splendid condition $15.00. Copies of this work are very scarce. Edward Chamberlain, 215 E. North Ave., Cranford, N. J.

Blueprints—Design for—Scale Model of Twin-Screw Yacht. 1 Profile and deck plan, size 13" x 22". 2. Lines, three views, 7½" x 23". 2 sheets price $1.25 post paid. Spon, 120 Liberty St., New York.

Amateur Work, some back volumes in numbers, Edward Chamberlain, 215 E. North Ave., Cranford, N. J.

The Stearley News Co., Brazil, Indiana will carry The Modelmaker in stock.

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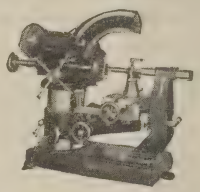

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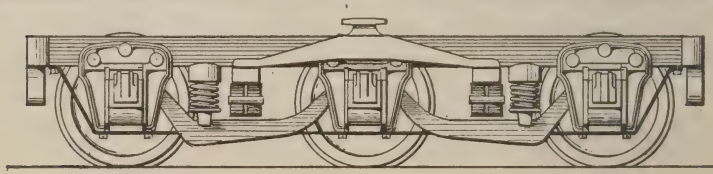

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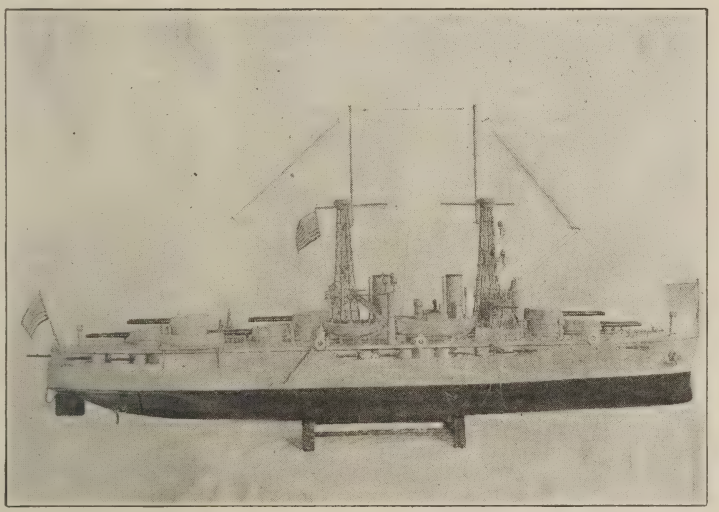

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OUR FOREWORD

One of the obstacles that has confronted the Modelmaker in the U. S. has been the difficulty of getting not only good sets of castings and blueprints but other necessary material, nuts and bolts, small hex head screws, fittings and accessories. We are glad to hear this difficulty is being overcome by new firms commencing to manufacture these articles.

One man reports, he has ready for delivery, hex head screws of various sizes of American standard threads. This is a line that should meet with a ready sale as screws are an article that every Modelmaker requires. He has complete sets of locomotive castings to 2½" gauge, also several other sets in preparation, some will be "O" gauge, castings for a uniflow steam engine, also some American standard railway signals.

Another firm has added to their line several different sets of castings for small stationary engines and boilers.

One correspondent is preparing parts for a standard Pullman car.

Another, castings of a small gasoline engine with interchangeable cylinders, one air cooled for model aeroplanes, the other cylinder water cooled for model power boats.

Several firms can supply complete sets of castings for locomotives of different types and gauge.

A western man reports, he is preparing a line of fittings for locomotives, also seats, doors and window frames for railway cars.

Another firm has sets of castings for several types of locomotives and complete sets of parts for a caboose and a box car, also track rail, automatic couplers, and sets of castings for passenger and freight car trucks, wheels, etc.

Another firm is placing on the market a four cycle aero engine, pump and other fittings.

A well established concern carries a large line of sheet, rod and piping in copper, brass or aluminum.

Besides all of the above articles, the following can be obtained. Model marine and stationary engines, boat fittings, boat hulls, yacht supplies, boiler materials, stationary gas engines, blue prints, and sectional drawings.

In all the above cases, the finished model complete ready to run, can be obtained if the customer so desires.

We do not wish to weary our readers with too much detail, but we believe they will agree with us that a new spirit of optimism and enthusiasm is coming into the Hobby and if we all get behind the band wagon and place our individual orders in the hat for whatever we may require for our fall work we will find Modelmaking in Canada and the U. S. going ahead with leaps and bounds.

We shall be glad to send a list of the firms names and address to any of our readers who will send us an addressed and stamped envelope.

Mr. H. B. Cox, of the Canadian Model Engineering Club of Toronto, informs us that their contribution to the Canadian National Exhibition will be twice as large as the 1924 exhibit. He could not give us the full list of models but mentions the following: A fine collection of models of the Toronto fire fighting apparatus, representing about 50 years of development of this class of apparatus and including some models of the most up-to-date apparatus. A ¾" scale model of the "Scotch Express," "Dunalister." Three ship models and a good many models of small engines, fittings, several models of naval guns, etc. Mr. Vollmer will have a section of his 1¼" gauge model electric railroad system. All of our Canadian readers, who can manage a trip to Toronto while the exhibition is running, should make a point to see the C. M. E. C.'s exhibit and get acquainted with the members in charge.

Mr. H. A. Hamlett, writes us, from California, that he is building a locomotive. As he has not the equipment for one in metal, he is constructing one in wood. A locomotive of the Mogual type, ¾" scale. In a model of this size, he thinks he can get in more detail than if he had made it a small scale. The wheels will be of babbit, or cast iron. It will be driven by an electric motor, wired for three leads. 1 to go forward. 2 to go reverse. 3 to operate the electric brakes. All to be operated from one point. He hopes to have his Model finished by the end of the year. When he plans to send us a description with photo.

Mr. Erwin Graham, of 10 Garden St., Hartford, Conn. would like to get in touch with any model enthusiast who may be located near his location with a view to starting a modelmakers club.

The American Model Locomotive Co. announced that they have moved into better quarters. Their new address is 236 Edna Street, San Francisco, California. The moving has delayed them a litle in filling orders but as soon as they are settled they expect to be able to give prompter service to their customers. The rail they recently put out for Model Railway Work has proved quite a success.

Can any of our readers inform us where bronze balls ⅛" up to ¼" can be obtained.

The Model Engineer, the principal contents of Vol. 26. Mr. G. P. Maginnis and His Model Work. Design for a Small Model Overtype Engine and Boiler with 2-page Colored Plate. Small Power Wireless Installations. A ¾ in. Scale G. N. R. Atlantic. A Small Engineering Workshop. Mechanical Instruction for Beginners. Experiments with Model Aeroplane Propellers. ¾ in. Scale Tank Locomotive. ¾ in. Scale 4—6—0 Loco Lathe Boring-Bars. Air Cooling for Small Gas Engines. Lessons from the Laboratory-Electrical. Motor Cycle Notes. Small Petrol Engine. Faults and Repairs in Electrical Installations. Target Models and How to Build Them. Multipolar Dynamo. Locomotive Notes. Drilling and Centering Fixture for the Lathe. Drummond Bros. Milling Machine. Electrically Driven Model L. & S. W. R. Locomotive. Design of Small Accumulators. Simple Home-Made Forge. Rotary Blower. Notes on Designographs. Maintenance of a Motor Cycle Engine. Uses of an Oscilloscope in Connection with Wireless Telegraphy. Construction of a Model Steamer Plant. Sectional Model Showing the Piston and Slide Valves Combined. Faults in Electrical Apparatus. Reverse Gear for a Drummond Lathe. Compressed Air Express Locomotive. Two Handy Tool Holders. Improving an Oil Engine. Automatic Cut-O Gear for Model Steam Engine. Model Steamer Machinery. Re-boring Locomotive Cylinders. Small Paraffin Carburettor. Dynamo Meters for Small Powers. Model of a Naval 6 in. Quick-Firing Gun. Model 7/16 in. Scale Six-Coupled Goods Tank Engine. Screw Cutting on a Plain Lathe. American Mountain Type 4—8—2 Locomotive. Notes on Spur Gearing for Model Engineers. Model Hydro-Planes. Development of the Power Plant for Model Aeroplanes. Sheet Metal Working for Model Engineers. ½ in. Scale 4—4—0 Locomotive. Compressed Air Motors for Model Aeroplanes. Mercurial Barometer. 1¾ in. Gauge Clock Work Railway. Four-Jaw Independent Chuck. Moulding and Casting Screw Threads. The Theory and Construction of Magnetoes. Modelling Fishing Boats. Horizontal Engine Fitted with Walschaert Valve Gear. Electric Locomotive. Steam Driven Plant for Model Aeroplanes. 0—8—2 Type Shunting Engine. Some Useful Alloys. Construction of Model Torpedo Boat Destroyer. Screw Cutting. Milling Appliance for the Lathe. Model Stationary Engine Boiler. Model Steam Rotary Aeroplane Engine. Oval Chuck for Ornamental Work. Steam Launch. Worm Gear Attached to Milling Appliance. Universal Milling Attachment. Making a Small Shaping Machine. Clock Repairing. Bench Tool Grinder. Spray Carburettor for 3½ H. P. Petrol Engine. Charging Board for Small Accumulators. Practical Letters Club and Society Doings. Queries and Replies, etc. Index. 620 pages, unbound, $2.00 per Vol.

Mr. E. D. Carpenter, 39 Victor St., London, Ontario, Canada, would like to hear from anyone in his locality who might be interested in Modelmaking, with a view to having an occasional friendly meeting to talk "Modelmaking." He is specially interested in Model Locomotives, both steam and electric.

LIQUID vs. SOLID FUEL FOR MODEL LOCOMOTIVES

By G. A. DIEHL

In this article I will relate only my own experiences with various kinds of fuel which I have tried out in my own locomotives. Alcohol was first tried in an open wick burner under a thin Smithies type boiler. It was possible with this arrangement to raise forty pounds pressure from hot water in about five minutes with induced draft. This system was entirely inadequate for a continuous running engine so I changed from the wick burner to a semi-vaporizing type of burner. This burner was able to keep up the steam but whenever the vaporizer became overheated the gas came out too rapidly and would blow itself out. I later put a pilot light in to keep it lighted but the flame would roar and draw in a lot of cold air which of course cooled the boiler. After that I tried no less than six different forms of alcohol firing all with bad results from one thing or another. I had decided that alcohol firing was only meant for firing toys and should have no place in the true model engineering field.

I read of many successful coal and charcoal fired locomotives so I made my second locomotive to take coal as I knew charcoal would work equally well with perhaps slight changes. I had a wide grate with as much room between the grate and crown sheet as possible and seven ½" copper flues. The coal was hard to start a fire in but when once under way it did very well except that when the door had to be opened, the draft cooled the tubes considerably and then the steam would be sluggish until that bit of coal had been heated through. After using coal for some time I opened the smoke box front and examined the flues.

I found a sticky, brown gum-like substance which had been distilled from the coal and deposited in the flues. I hadn't noticed a great deal of difference in the efficiency of the boiler though. Undoubtedly the efficiency was lowered some. With this same fire box I tried out gas-coke, soft coke, such as comes from forges and charcoal. In all three of these fuels I noticed very little difference as to their steaming qualities. They were easier to start a fire in than coal was and they maintained a more even heat.

The main trouble I find with solid fuel is that it is much more troublesome and messy than the system I am about to describe.

In my third locomotive I made the fire box considerably smaller and also cut down the number of flues to five ½ inch copper ones the same length as the last one. I started to work on the principle of the blow torch. The first one I made was very small and gave trouble by clogging at the nozzle with carbon. I made a larger one which worked well but was too large and awkward-looking for a small model. (½" scale). Then too this one was noisy and it would blow itself out, but regulation of the air ports cured this. This burner also gave trouble by letting unburned gas escape to the chimney. The flame would seem perfect but I could burn gas at the stack by holding a lighted match to it. Next I spent many weeks figuring out a gasoline burner that would go entirely inside the firebox that would correct all the faults of the other systems. Finally I devised one with a single straight vaporising tube over the burner body and run to a nozzle outside the fire box and burn with no smoke.

Needless to say I had many problems to conquer. I completed the drawings on this, then made it and put about five pounds air pressure on the tank. The vaporizer was heated and the fire lighted. The burner gave a clear greenish blue flame with almost no noise at all. I could throttle the fire down so it could scarcely be seen or I could make it burn full blast with just the slightest turn of the needle valve. The whole mechanism was enclosed in the firebox with but a single tube leading from the tender. I tested the gas at the smokebbox and found nothing inflammable or objectionable to smell, even with the fire wide open. No induced draft is necessary with this method of firing. With cold water in the boiler, just five flues and a small 2" by 2" by 4" fire box I could raise ninety pounds pressure of steam in just three minutes flat. I fitted a small alcohol pilot light in it later so I could turn the main fire clear out when leaving it for some time. When I open the valve the main fire promptly starts just as clear and blue as before. With the burner nearly wide open I can maintain a pressure of ninety pounds in the boiler when the engine is pulling heavy loads. I think I have hit upon the right way to fire small locomotives at last. I get away from having to shovel in fuel and keep the grates and ash pan clean as well as the flues. Also I get away from messy and slow starting of the fire. When I want more heat I just turn a

valve outside where it is easily reached. Then too, the tubes and plates are always at their original efficiency due to absence of soot and deposits on them.

Solid fuel may possibly be more economical than liquid fuel but such a trifling amount is used that we forget economy and choose the fuel which is least troublesome to use. Others may have had equally fine results with solid fuel as I have with liquid, but can we make comparisons without trying both methods thoroughly?

A DRILL VISE

By J. W. NEPTUNE

I am enclosing a sketch outline for a drilling vise that I made up some time ago, and as it has proved so good, I thought possibly some of the other fellows who read The Modelmaker might be interested and like to make one for themselves.

I had purchased a Vise Drill of a well known make to use in my work. Unfortunately, one day, it fell off the drill press table and struck a casting with the result that it busted. I decided then that I could make a better one that would serve my purpose and that would not break, so I made it from cold rolled steel. Just scraps that I found laying around the shop and it has given me excellent service.

The general dimensions are as follows:

The base is a piece of ¼" cold rolled steel x 2½" x 4 13/16".

The guides are ½" round C. R.

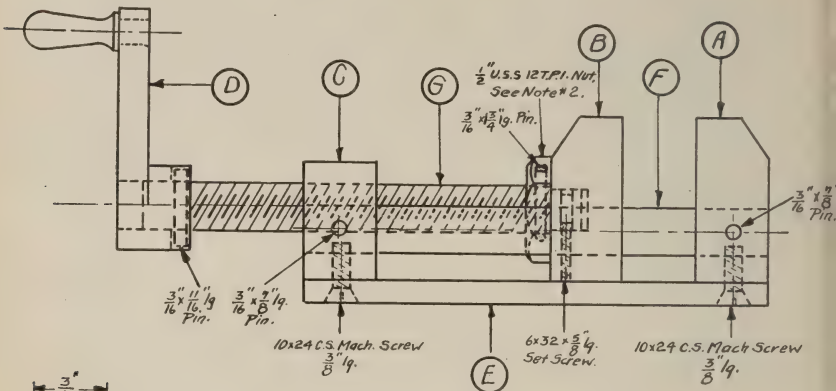
The screw is one that came out of a broken C. clamp, which I cut down.

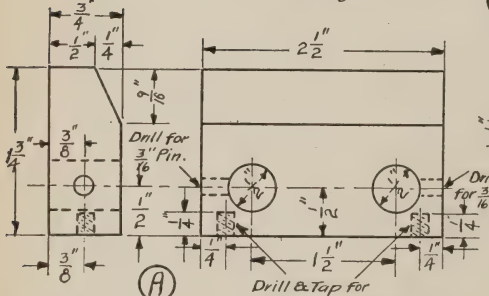
The thrust collar is a ½" hex. nut run on and then turned and pinned.

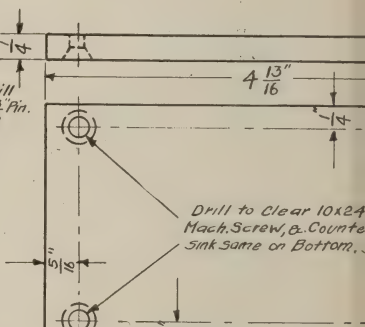
The handle was cut out of C. R. stock.

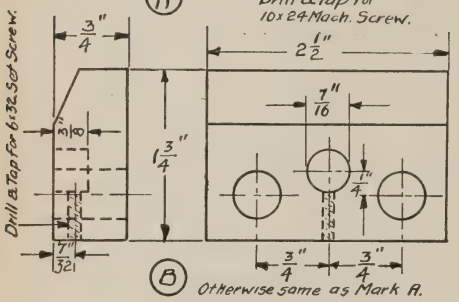
I cut the jaws and end pieces all out of scrap material, drilled, tapped and then case hardened them.

Mr. F. D. Grimke kindly took Mr. Neptune's sketch and made a complete working drawing, filling in all the necessary details and measurements. The illustration shown herewith is a reduced size, as Mr. Grimke makes his drawing the full size of the Vise.

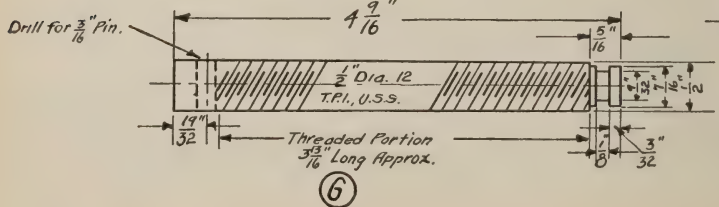

D
C
G
B
F
A
1/2" U.S.S 12T.P.I. Nut. See Note #2.
3/16" x 1 3/4" lg. Pin.
3/16" x 7/8" Pin.
3/16" x 11/16" lg Pin.
3/16" x 9/16" lg. Pin.
10x24 C.S. Mach. Screw 3/8" lg.
6x32 x 5/8" lg. Set Screw.
10x24 C.S. Mach. Screw 3/8" lg.
E

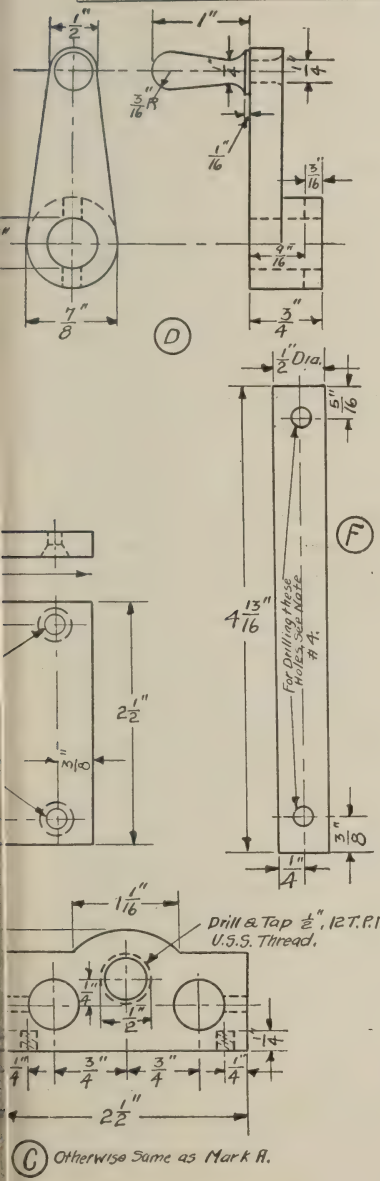

3/4"
1/2"
1/4"
2 1/2"
9/16"
1 3/4"
3/8"
Drill for 3/16" Pin.
1/2"
1/4"
Drill for 3/16" Pin.
1 1/2"
1/4"
3/8"
A
Drill & Tap for 10x24 Mach. Screw.


1/4"
4 13/16"
1/4"
Drill to Clear 10x24 Mach. Screw, & Counter Sink Same on Bottom.
5/16"
1/4"
E


3/4"
2 1/2"
Drill & Tap for 6-32 Set Screw.
3/8"
7/16"
1 3/4"
1/4"
7/32"
3/4"
3/4"
B
Otherwise Same as Mark A.

5/8"
1 1/4" Drill for 3/16" Pin.
5/16"
5/16"
Drill & Tap f
10x24 Mach.


4 9/16"
Drill for 3/16" Pin.
5/16"
1/2" Dia. 12 T.P.I., U.S.S.
1/32"
7/16"
1/2"
19/32"
Threaded Portion 3 13/16" Long Approx.
3/8"
3/32"
G



MATERIAL LIST.

ITEM No.	DESCRIPTION	MARK No.	REMARKS.	No. REQ.
1.	Fixed Jaw	A		1.
2.	Movable Jaw	B		1.
3.	End Piece	C		1.
4.	Handle	D		1.
5.	Bottom	E		1.
6.	Guides	F	Round C.R. Steel	2.
7	Lead Screw	G	" " " "	1.
8	Pin		3/16" Dia x 11/16" lg.	1.
9.	"		3/16" " x 7/8" lg.	4.
10.	"		3/16" " x 1 3/4" lg.	1.
11.	C.S. Mach. Screw.		10x24, 3/8" lg.	4.
12.	Set Screw		6x32, 5/8" lg.	1.
13.	Nut		1/2" U.S.S. Stan. 12 T.P.I.	1.

1. All pieces to be machined all over.
2. Thrust Collar to be 1/2" U.S.S. Standard Nut, 12 T.P.I. The Nut is run up on threads of Lead Screw, trued up & then Pinned in place.
3. All pieces to be made of C.R. Steel, except as noted.
4. These Holes to be 3/16" Dia, and are to be drilled when assembled in End Piece & in Fixed Jaw.
5. All Pins are to be made from 3/16" Drill Rod.
6. Fixed and Movable Jaws are to be Machined, Drilled & Tapped before Case hardning.

DRILL VISE.

MADE FROM COLD ROLLED STEEL

J. W. NEPTUNE.

Date 8/20/25.

Copyright Spon & Chamberlain 1925.

MARBLEHEAD MESSENGER MODEL YACHT REGATTA A SUCCESS

By ALFRED D. MANTON

The long anticipated races of model yachts, under the auspices of the Marblehead Messenger, were held at Red's pond, Marblehead, Saturday, August 29, at 9:30 A. M. One hundred seventy-three entries were received for this classic.

This was by far the largest and most enthusiastic affair of its kind ever held in this part of the country. Entries were received from Lynn, Salem, Beverly, Swampscott, Nahant, Manchester, Gloucester, Peabody, Danvers, Brookline, Newton, Boston and Marblehead.

Twenty silver cups were donated by various business men and friends of Model Yacht racing, including the Marblehead Board of Selectmen, Marblehead Board of Trade, Rep. Joseph Martin, Marblehead Model Yachts, Inc., F. Norris Osborne, John F. Randall, Richard M. Cook, Roger Buck, Salkins & Laskey, Edward T. Haley, Haley Lever, S. Harvey Mace, William E. Lavender, Frank W. Stearns, Harry Allen, Shepard Stores of Boston, Manataug Tribe No. 1, I. O. R. M., Marquis Smith, and the Marblehead Messenger.

Frederick A. Mayberry was in charge of the Regatta, assisted by Percy L. Martin, William N. West, and the following officials: William E. Lavender, starter; Rep. Joseph Martin, Timer; Rev. R. T. Broeg, Recorder; and Capt. Wilbur M. Merrill, Measurer.

The Judges were F. Norris Osborne, George E. Nichols, John F. Randall, John G. Stevens, William F. Aldrich, Thomas W. Storrow, Marquis S. Smith, Arthur M. Humphrey, Frank Belknap, Chandler Bowditch, Reuben Grysmish, Dr. Samuel Eveleth, Dr. William Haley, C. H. W. Foster, Francis B. Crowningshield.

All entries were placed in the following classes:

Class A—12″ O. A. L.
Class B—18 to 22″ O. A. L.
Class C—24″ O. A. L.
Class D—24″ O. A. L. Schooners.
Class E—25 to 28″ O. A. L.
Class F—30″ O. A. L.
Class G—32 to 48″ O. A. L.

The Regatta Committee tried to simplify the rules as much as possible, which were as follows:

Rule No. 1—No boat allowed to race until checked by the Recorder.

Rule No. 2—Not over two persons allowed to handle a boat. A person at each end of the Pond.

Rule No. 3—No sticks or poles over 36" long allowed to be used to control boats.

Rule No. 4—Time allowance dependent on wind and judgment of the officials.

Rule No. 5—Certificates for cups awarded winners, cups to be delivered as soon as engraved.

Rule No. 6—The judges will announce the winners at the finish of each race, and the Recorder, Mr, Broeg, will present certificates. All decisions final.

Rule No. 7—The Regatta Editor reserves the right to disqualify any boat.

The races started at 9:30 A. M. The class to be raced was announced, and one stroke of the bell was the signal to get ready, and two strokes of the bell to get set, and a pistol shot started the boats off.

Every conceivable kind of a sailboat was entered: Cats, Marconi Rigs, Sonders, Sloops, Rigs, etc. Some of the boats were solid, some were hollow and some of the hulls were made of rubber composition moulded.

The winners by classes were:

Class A—2 Cups—1st, James W. Jones; 2nd, Gordon Woods.

Class B—4 Cups—1st, Melvin Bailey; 2nd, C. F. Spencer; 3rd, Evelyn W. Mayberry; 4th, Anne Upton.

Class C—4 Cups—1st, Kathryn Thomson; 2nd, Charles W. Coffin; 3rd, W. G. Jones; 4th, G. C. Wolworth, Jr.

Class D—2 Cups—1st, L. G. Foan, Jr.; 2nd, Harlan W. Trott.

Class E—1 Cup—1st, Allen Mitchell.

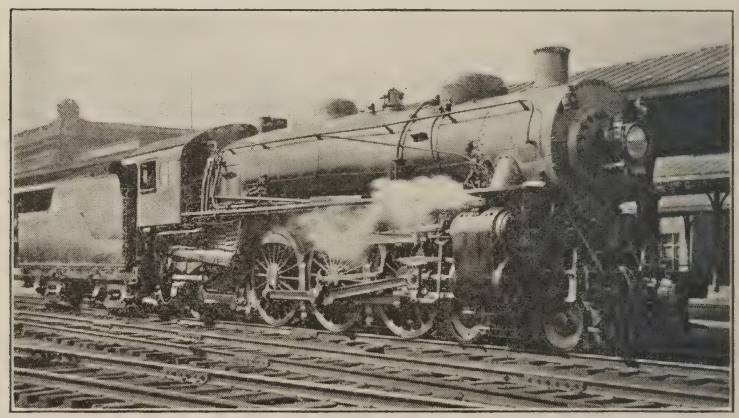
Class F—3 Cups—1st, W. M. Merill; 2nd, Curtis Coffin; 3rd, John R. Simmons.

Class G—2 Cups—1st, F. R. Bogardus; 2nd, S. H. Mace.

DIMENSIONS OF CLASS K-3, NEW YORK CENTRAL RAILROAD

MR. ARTHUR CURRAN

Since writing to you the other day, it has ocurred to me that you might like a photograph of one of the famous K—3 Pacific engines of the New York Central. Accordingly, I am handing you herewith a snapshot of No. 3376, taken at Albany. By reproducing this in the Modelmaker, prospective model builders will get a good idea of the general design of this splendid 4—6—2. Its principal dimensions are as follows:



Fuel—Soft Coal.
Weight on driving wheels, pounds—172,000.
Weight on leading truck, pounds—50,000.
Weight on trailing truck, pounds—49,000.
Weight total of engine, pounds—271,000.
Weight of tender, pounds—153,700.
Wheel base, driving, feet and inches—14, 0.
Wheel base, total of engine, feet and inches—36, 6.
Wheel base, engine and tender, feet and inches—68, 0.
Cylinders, diameter and stroke, inches—23½ x 26.

Valves, type—Piston.
Valve gear—Walschaert.
Wheels, diameter of driving, inches—79.
Wheels, diameter of truck, inches—36.
Wheels, diameter of trailing, inches—50¼.
Wheels, diameter of tender, inches—36.
Journals, driving, main, inches—10½ x 19.
Journals, driving others, inches—10½ x 14.
Journals, truck, inches—6½ x 12.
Journals, trailing, inches—8 x 14.
Journals, tender, inches—5½ x 10.
Boiler, type—Conical Connection.
Boiler pressure, pounds—200.
Boiler, outside diameter, front end, inches—72.
Boiler, outside diameter, back end, inches—83.
Firebox, length, inches—108⅛.
Firebox, width, inches—75¼.
Tubes, number and diameter, inches—175—2¼.
Flues, number and diameter, inches—32—5½.
Tubes, length, feet and inches—21—6.
Heating surface, tubes and flues, square feet—3,193.
Heating surface, firebox, square feet—204.
Heating surface, arch tubes, square feet—27.
Heating surface, total, square feet—3,424
Supheating surface, square feet—765.
Grate area, square feet—56.5.
Water capacity of tender, gallons—7,500.
Fuel capacity of tender, tons—12.
Length over all, engine and tender, feet and inches—77—4⅛.
Extreme width, feet and inches—10—4.
Extreme height, feet and inches—14—10.
Tractive power, maximum, pounds—30,900.

My present object is merely to invite attention to the general design and appearance of this class, and to suggest that, in the interest of accuracy, photos of some of the notable locomotives in this country be published in the Modelmaker. By so doing, all concerned would have a handy reference to the "real thing," and many errors would be avoided. I shall be pleased to supply further photos of engines in service, if this idea proves helpful.

CORRESPONDENCE

R. B. D. Flint, Mich.—We have not published any articles yet on Model aeroplane construction but we hope to later on. There are no cheap books on this subject. We would recommend Johnson on Model Aeroplaning, it treats the subject from the scientific standpoint but shows many practical examples, fully illustrated. This is the best work we know of on the subject.

J. S., San Francisco, Calif.—We do not know of any complete work dealing specially with the construction and rigging of models of old sailing ships. There have been some very good illustrated articles in back numbers of the Model Engineer. Hobbs book-Model Sailing Yachts has a long chapter, illustrated, on this subject. Mr. G. B. Douglas has a large collection of drawings showing lines and sail plans of famous old sailing ships. We do not believe there is another such collection in the country.

W. T. F., Mt. Vernon, N. Y.—We do not import any models, castings, or supplies. We gave up this work just before the War. See our adv. pages. There are several firms who attend to this business for customers.

H. A. H., Campbell, Calif.—We have not published any articles on bearings. There is an excellent little work by Twelvetrees entitled: Fitting and Adjusting of Bearings, fully illustrated. This, we believe, will answer your questions in a practical manner.

The Model Railway News, principal contents for August issue. The Normanby Park Railway. An O Gauge Railway in a Small Space. Model Railway Turn Tables. Design for an Automatic Reverser. A Ninety-two Year Old Model. Springing O Gauge Bogies. Locomotive Running Sheds. On Choosing Locomotive Types. Queries and Replies. Our Mail Bag. With The Clubs, etc.

The Model Engineer, principal contents for July 30 to Aug. 13. A Filing Machine for Finishing Small Parts. The Construction of a Twin Horizontally Opposed 2-in. by 2½ in. Petrol Engine. An Ideal Storage Cell. A Simple Auto-detector Fire Alarm. Making a Loud Speaker in a Small Workshop. Small High-Speed Petrol Engines. 100 Years of Railroad Engineering. Piston Valves or Slide Valves for Model Work. Cutting a Small Wornwheel on an Ordinary Screw Cutting Lathe. Water-Driven Vacuum and Pressure Pumps. Model Light Cruiser "Caversham." Old-Time Steam Models. Simple Advertising Novelties. The Trials of Captain Howey's New 15 in. Gauge Pacific Loco. on the the R. & E. Railway. Recent Inventions. Queries and Replies. Practical Letters. Society and Club Doings, etc.

Blueprint of Drill Vise, with full details and list of materials, scale full size, size of blueprint 19 x 14 in., price 75 cents postpaid. Spon, 120 Liberty Street, New York.

FOR SALE

Launch, $6.00, Copper Marine Boiler, $7.00, Featherweight Destroyer Engine new $10.00, Centrifugal Pump $2.00. Robertson, 1 Shaw St., Hamilton, Ont., Canada.

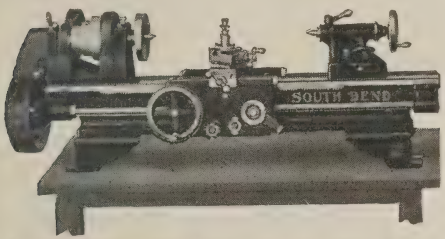
Morgan 20 Ft. Glider. I can supply the necessary materials to build your own. Icken, Morsemere, New Jersey.

Patterns—Wood and Metal, Models and Small Castings. Special attention to modelmakers wants. J. H. Koch, 103 Summit Ave., Linwood, Pa.

Clockmakers Lathe—Similar to Goodell-Pratt No. 700. Price $16.00. Bargain. Send for details. W. C. Steuart, Modelmakers' Supplies, 2227 Callow Ave., Baltimore, Md.

Blue Prints of Ships for Modelmakers, send for circular. G. B. Douglas, 165 Summit Ave., Upper Montclair, N. J.

Horizontal D. A. Steam Engine, 1" x 1¼", Tunnel Guide, mostly of steel, all bushed for wear, just built. Photo 10c. Bray, 35 Summit Ave., Jersey City, N. J.



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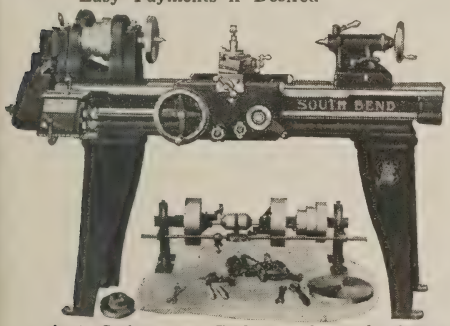

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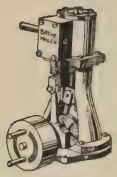

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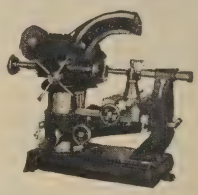

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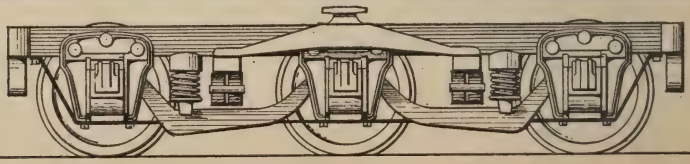

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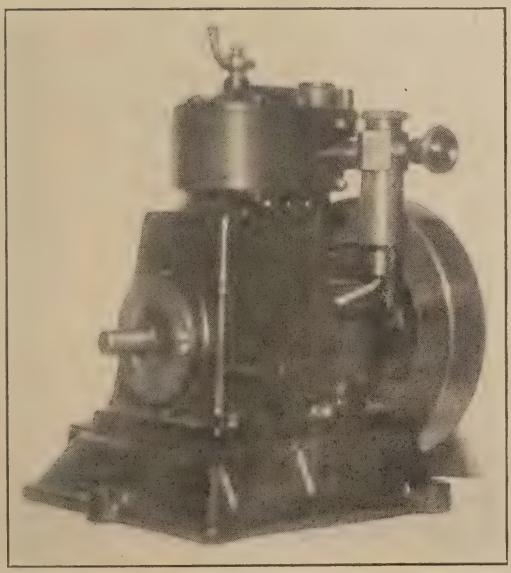

HIGH SPEED "UNIFLOW" STATIONARY SINGLE ACTING
STEAM ENGINE 1" BORE x 1" STROKE
By Mr. Frank Birch

THE MODELMAKER

Published by SPON & CHAMBERLAIN

120-122 LIBERTY ST., NEW YORK, N. Y.

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Vol. II. No. 10

"Entered as second-class matter Mar. 27, 1925 at the Post Office at New York, N. Y. under the Act of March 3, 1879."

OUR FOREWORD

We have before us a clipping from the Los Angeles Times, (Calif.) of July 16, 1925 about three boys who have been making models of ships and railway cars; in fact they have made such a financial success of their efforts that they have decided to form a company and have asked the State Corporation Department for permission to issue and sell $250,000.00 worth of stock.

This strikes us as a pretty big proposition for three youths just out of High School. They propose to invest $40,000.00 in property and erect a factory for the manufacture of all kinds of commercial models. They claim to have already made about 150 different models.

In trying to digest this proposal two essential elements loom up very large. First—the technical knowledge and skill necessary, and Secondly—the ability and commercial knowledge required to successfully operate a quarter of a million dollar corporation.

We pause to allow our mind to recall some of the best known modelmakers, and when we use that word we do so with its highest meaning. Such names as these come before us—Henry Greenly, a skillful draftsman and model designer of many years' experience. E. W. Hobbs, who has been designing and constructing model boats from boyhood and who is a Naval Architect by profession. Stuart Turner, who served a long apprenticeship at marine engineering and who was an engineer in deep sea vessels for years before ill health compelled him to turn his attentions to the construction of marine models for a livelihood. Bassett-Lowke, famous the world over for his beautiful ship and locomotive models and who has spent years in scientific study. E. W. Twining, who has devoted the past 25 years to the designing and building of model aeroplanes and the construction of old sailing ships. A. H. Avery, of Tunbridge Wells, a fine mechanic and scientist whose small dynamos are marvels of finish and workmanship, and a host of men in our own country.

Mr. Boucher, who has constructed many fine ship and yacht models. George Bender, H. A. Conventry, A. W. Line, Frank Birch, Tom Bray, A. Menne, P. W. Nicholls, J. A. Joslin, E. Thatcher, and many others all of whom are either trained engineers, draftsmen, tool makers, or first class mechanics. Every one of them with technical knowledge and above all the love of the work in them.

We do not believe that a single one of these men ever dreamed of being the organizer of such a company as mentioned in this news item from our Sunny Western State famous for its fruits and flowers.

The question that occurs to us is where did these youths get their scientific knowledge and commercial experience to entitle them to ask the public for their hard earned cash to back this venture.

Or is the L. A. Times just trying to spring a joke upon the real modelmakers of this great country.

L. A. T. let us hear from you.

The Modelmaker would like to get $250,000.00. We would then give you a magazine that would make your eyes pop out, but we have not the colossal nerve necessary to ask the public for such a gift.

Enough said. What do our readers think about it?

Write us.

Mr. G. B. Douglas has returned from a two-months vacation Down East. He showed us a number of photos he had taken of an English Bark, especially views of the spars and standing rigging showing the methods of connecting the rigging to the ship and other details of value to the model ship builder. He intends to use some of these pictures in his new book, "The Rigging of Ship Models" which is now in the press. At the present time there is no book on the market fully explaining all the intricacies of a ship's rigging, and how it is set up. If this work interests any of our readers, send us your name and address for further particulars.

HIGH - SPEED "UNIFLOW" STATIONARY STEAM ENGINE.

By Frank Birch

This model represents an entirely new departure in working model steam engines. The steam is distributed on the "Uniflow" principle by a poppet valve and side exhaust ports. The whole of the working parts subjected to steam are of iron, or steel, and therefore may be used with highly superheated steam. The pressure on the crankpin is undirectional, which eliminates all knocking.

The exhaust stroke compression period is a lengthy one, which function reduces cylinder condensation and steam consumption. The engine is eminently suited to service requiring a high speed over long periods.

Specification of "Uniflow"

Cylinder single acting, 1" bore x 1" stroke, cast integral with crank case.

Connecting rod, light gunmetal, channel section.

Piston, light cast iron with steel gudgeon pin.

Cam, case hardened steel with steel tappet rod and inlet valve.

Base, cast iron, flywheel 3¾" with 1¾" dia. grooved pulley.

Speed, this varies slightly with individual engines.

60 lbs. steam pressure at engine—2,500 R. P. M.

75 lbs. steam pressure at engine—3,500 R. P. M.

A boiler with 100 to 200 sq. ins. of heating surface should be used with this engine according to duty required.

This engine can be machined throughout on the lathe, the design being very simple, and suitable for amateur building.

POSTAL ADDRESS

We have just received a communication from the U. S. Post Office in which they request us to say that "mail matter is often delayed and some is never delivered because the full postal address has not been used."

This is a very important matter and we would draw the attention of our readers to the following:

Give full name, clearly written.

Box No. and R. D. if any,

Number of Street, Road or Avenue,

Town, County and State.

The easier you make it for the letter carrier the quicker you will get your mail.

If any of our customers are not receiving their mail regularly, kindly advise us sending your present address and we will look into the matter at once.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, OF THE MODELMAKER, published monthly at New York, N. Y., for October 1, 1925.

STATE OF NEW YORK }
COUNTY OF NEW YORK } ss.:

Before me, a Notary Public, in and for the State and County aforesaid, personally appeared W. Edmunds Spon, who, having been duly sworn according to law, deposes and says that he is the Editor and Business Manager of the MODELMAKER and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations printed on the reverse of this form, to wit:

1. That the names and addresses of the publishers, editor, managing editor, and business manager are:

Publishers, Spon & Chamberlain, 120 Liberty St., New York, N. Y. Editor, W. Edmunds Spon, 120 Liberty St., New York, N. Y. Managing Editor, none; Business Manager, W. Edmunds Spon, 120 Liberty Street, New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: NONE.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation, has any interest, direct or indirect, in the said stock, bonds, or other securities than as so stated by him.

W. EDMUNDS SPON,
Editor and Business Manager.

Sworn to and subscribed before me this 29th day of September, 1925,

ELVIRA H. PFLUGER,
Notary Public, New York Co., New York.

(My commission expires March 30, 1927.)
[Seal]

Certificate filed in New York Co. No. 857. Reg. No. 7073.

Mr. John S. Fyfe of Cranford, N. J., a connection of the famous yacht designer of that name, has completed a model of the "Resolute," one of the "America Cup" defenders. It is a good example of model work, but the builder frankly admits it is not perfect. He intends to build another, which he hopes will be exact in every minute detail.

SINGLE CYLINDER HORIZONTAL AUTOMATIC STEAM ENGINE

By W. J. EDWARDS

This is a description, with photos of a model single cylinder horizontal automatic steam engine that I designed and built.

When I started out to build this model steam engine, I wanted one that would be large enough to drive a Ford generator, and at the same time I wished to see what could be done, using the methods known to toolmakers, also I wanted to make it all myself, from the drawings up, and at the same time get an insight into the intricacies of the Rites Inertia Governor.

The first job of course was to read up on the subject and to make a few rough sketches, after which I decided to build my engine on the unit system.

The cylinder was tackled first, this being the business end, so to speak. Patterns were made and castings obtained in semi-steel. Each head is separate which makes it easier to machine. The cylinder casting was first held in the lathe chuck, turned on one end, and bored, and counter-bored, after it was pressed on to an arbor, then the other end faced off. The valve face was planed on the shaper, after which the valve ports were drilled and milled out. The job was then remounted on the arbor, which was held in V blocks on a B & S surface grinding machine, and a light cut taken off the face, which insured everything being perfectly square.

The bore was not ground out because it was considered smooth enough and was already true with the flanges.

The heads need no description, except that they were turned all over, when mounted on an arbor.

The steam chest, cover, and slide valve are of phosphor bronze and were a simple job.

The piston rod and cross head is in one piece, and is of tool steel with white bronz slide blocks screwed on and so made that shims can be inserted to take up any wear.

The piston is of cast iron and made in two pieces, with two eccentric rings fitted into one grove, and is a tapered fit on to the rod, and fastened by a bronze nut and cotter pin.

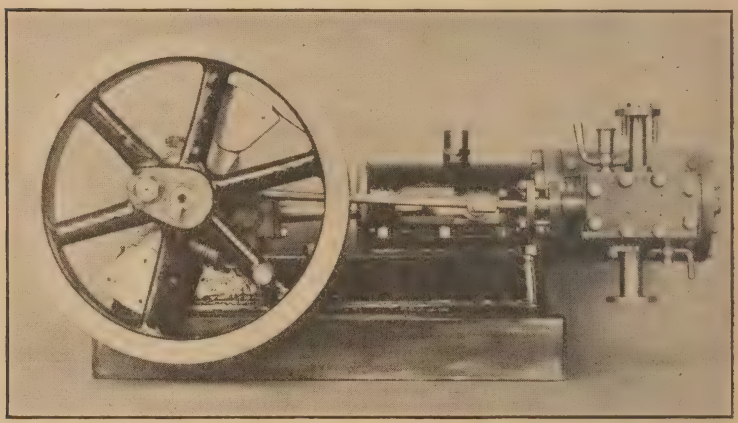
The next job was the cross-head guide, which is also of semi-steel, and was bored, turned and faced, planed and ground on the

bottom, the same as the cylinder was done, and a true surface was made on one side, parallel to the bore. It is fastened to the bed casting by six ¼" bolts and two 3/16" dowels.

The bed plate was next taken in hand and is made with two locating lugs on the side.

The casting was planed and ground both top and bottom and a ¼" keyway milled at the center line of crank shaft and at exactly 90 degrees with the locating lugs.

The crankshaft was turned from a machine steel block 9/16" x 1¾" x 4¾" and ground all over, and fitted with balance weights. It has an oil channel running from the journals to the crank pin, which insured perfect lubrication.



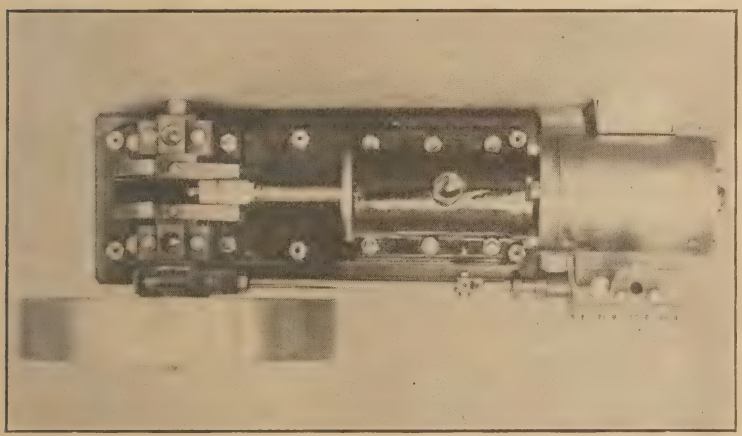
The bearing unit was the next job and was made both together out of a bronze casting and fitted with white bronze brasses and shims.

The crankshaft was planed up all over and mounted on a Van Norman milling machine, where the stock was cut out for the brasses, and cut almost in two and left there while the brasses were planed up and fitted, after which they were bored out both together with the caps in place, and a keyway cut on the center line to correspond with the one in the bed plates. The two bearings were then severed, which insured everything being dead square.

It was then decided to assemble what units I had so as to get the exact length of the connecting rod. This was done by planing the bed on its side on a surface plate, with the help of an angle iron, and clamping the crosshead head-guide on and indicating along the plane surface and drilling two bolts holes. After retesting, the dowel pins were put in, with the rest of the bolt holes, which resulted in the cylinder and crankshaft being dead square.

The connecting rod is of tool steel and is of the marine type and is also fitted with white bronze big end bearings, and when assembled to the rest of the engine turned freely although in no place was the clearance more than .0005 at the bearing surfaces.

The fly wheel assembly needs no description except that a bushed hole is made in the boss, for the cramp pin to fasten the Rites governor to. The Governor is as follows:



A weighted beam, or arm, with one end larger and heavier than the other, pivoted so that it will swing end ways, has the eccentric bolted onto it, in such a way that the centrifugal force of the heavy end will cause the eccentric throw to become less, until the steam ports do not open at all, which, as can be seen, will give more expansion of steam in the cylinder, this is why the automatic engine is so economical.

It is not practical to build a slide valve, or piston valve for that matter, with a cut off of less than ⅝ stroke, without increasing the valve travel out of all proportions.

What happens with this engine is this.

The steam is turned on, a spring holds the eccentric to its full opening against the weighted beam, until it is overcome by centrifugal force and the valve is caused to travel less and give a quicker cut off, in fact the cut off can be from zero to ⅞ stroke. Now the force of Inertia is also used in this type of governor and is made use of as follows.

The engine is running at full speed and load. An extra load is suddenly put on, which would under normal conditions slow the engine down, but, the governor beam and weights would continue to travel at its old rate of speed through its inertia and so cause the eccentric to throw out further, giving more travel and less cut off until the speed was normal again.

The opposite would happen should the load be suddenly taken off. The engine would start to run faster but the governor would not respond so quickly and this is what makes it so popular for driving generators, for it will give in a well designed engine a speed variation of less than 2/10 per cent.

The following are the chief dimensions:

Base, 8¼" long, 3" wide, and 1⅛" deep.
Fly wheel, 6" dia. x 1⅛" face.
Cylinder, 1¼" bore x 1¾" stroke.
Steam ports, ⅝" x 3/32".
Exhaust ports, ⅝" x 3/16".
Valve travel, ⅜".
Lead of valve, .010".
Piston, 5/16" dia.
Connecting rod, 5/16" dia. x 4 9/16" center.
Crankshaft, 13/32" dia. x 4¾" long.
Length of engine over all, 13¼".
Height, 6¼" without sub base.
Cross head guide, 1¼" long.

Mr. Eric B. Holst, 7238 Franklin St. Forest Park, Ills., is very much interested in model locomotive work. We would like to get in touch with any model enthusiasts in his vicinity with a view to the formation of a Model Engineers Club for mutual encouragement and help.

A Correction

In the advertising section of the September issue the address given for the American Model Locomotive Co. was their old one. It should have read—236 Edna Street, San Francisco, Calif.

CANADIAN NATIONAL PASSENGER LOCOMOTIVE

Mountain Type, 4—8—2. 6,000 Series

We are indebted to Mr. J. H. Guild for the following particulars, which we believe will interest many of our readers.

The illustration shows one of the largest passenger locomotives in Canada. The latest development in design for power and economy of operation. It will pull a passenger train of fifteen cars at an average speed of 73 miles per hour.

General Specifications.

Cylinders, 26″ dia., stroke, 30″.
Driving wheels, 8, O S, dia. 75″, dia. ctr. 66″.
Bogie wheels, 4, 34¼″ dia.
Trailer wheels, 2, 43″ dia.
Wheel base, bogies, 6′ 8″.
Wheel base, drivers, 19′ 6″.

Wheel base, total of engine, 41′ 9″.
Tender—2, 6 wheel trucks.
Tender—wheels, 34½″ dia.
Tender—total wheel base, 24′ 11″
Extreme width of engine, 10′ 5¾″.
Overall length of engine and tender, 90′ 4¼″.
Height from rail to top of smoke stack, 15′ 3″.
Height from rail to top of cab, 15′ 3½″.
Front end of boiler, 32-7/16 dia.
Back end of boiler, 90″ dia.
Type of boiler, straight top.
Boiler pressure, 210 lbs. to sq. in.
Fire box, length, 114⅛″.
Fire box, width, 84¼″.
Grate area, 66.77 sq. ft.
Brick arch, Canada.
Type of fire door, Franklin No. 9.
Grate shaker, Franklin.
Stoker, Duplex.
Heating surface, tubes, 3730 sq. ft.
Heating surface, firebox, 319 sq. ft.
Heating surface, total, 4,049 sq. ft.
Heating surface, super heater, 810 sq. ft.
Combustion chamber, 4′ 0½″.
Power reversing gear, Precision.
Type of valve gear, Walschaert.
Type of cab, steel vestibule.
Type of headlight, Pyle K2.
Steam heat, yes.
Size of air pump, 8½″. One pump.
Weights in working order—engine truck, 57,300 lbs.
Weights in working order—driving wheels, 226,770 lbs.
Weights in working order—trailing wheels, 54,930 lbs.
Total weight of engine, 339,000 lbs.
Total weight of tender, 236,000 lbs.
Total weight of engine and tender, 577,000 lbs.
Light weights, drivers 204,100 lbs.
Light weights, engine, 303,300 lbs.
Factor of adhesion, 4.57.
Maximum tractive effort, 49,600.
Boiler tubes, large, 40, 5½″ dia.
Boiler tubes, small, 188, 2¼″ dia.

Boiler tubes, length, 22′ 3″.
Tender capacity, water, 10,000 gals.
Tender capacity, coal, 17 tons.
Superheater, Robinson.
Haulage rating, 50%.
Fitted with feed water heater "elesco."
Fitted with extended piston rods.
Fitted with "Rogalchoff" crossheads.

The Secretary of the Chicago Society Model Engineers reports that their members have a number of model locomotives under construction, and that the Society has decided to build a half mile of railroad track for the members to test out their different models. This is a very excellent scheme as it will make practical tests feasible and the merits of each model may thereby be more correctly judged, and the performances of different types of locomotives compared. We hope the members of this Society are preparing for a good model Exhibition this fall. They have the talent amongst their men and they must not forget as one of the premier societies of the U. S. we are all interested in hearing about what their members have constructed during the past year. Keep it up C. S. M. E.

Mr. Harold A. Hamlett of 232 So. Quince St., Exeter, California and Mr. Whitney are both interested in model locomotive work. These gentlemen would like to hear from other enthusiasts in their neighborhood with a view to a get-to-gether meeting once-in-a-while. The Modelmaker has a large following in this State so we hope they will hear from some of our readers.

Mr. Anton Bohaboy has just completed a Model Locomotive. It is based upon the design of the "999" Class, N. Y. C. R. R. 4—4—0, scale ¼″, gauge 2½″. The cylinders have a bore of ⅞″ with a piston stroke of 1½″. It is fitted with full Walschaert valve gear. Driving wheels 4″ dia., pony wheels 2″ dia. Boiler 4″ dia., flue 2″ dia. with 16 cross tubes 5/16″, fired with a blow torch. Steam pressure 80 lbs. Length of engine over all 26″, length of tender 17″, height from track to top of smoke stack about 10″. The tank is divided with a partition ¾ for water, about ½ a gallon, the other part for the blow torch.

Mr. A. W. Line was in New York recently and paid us a visit. He showed us a pair of 4 wheel car trucks for "O" gauge railway. The truck frames are composed of five pieces and two pair of wheels. The parts fit together and are held in place by two small pins. All these parts are die castings in a hard white metal, making a very well designed and compact piece of work. He also showed us castings of other types of truck frames. He said he had enough work on hand to occupy his leisure time for the next two years.

A MECCA FOR MODELMAKERS

By GEO. A. CUTHBERTSON

Of all the places in the whole wide world that stands out in the memory of all those who have had the privilege to pay it a visit, the Science Museum, in South Kensington, in the City of London, England, is without any doubt the one that takes First Place. In that great City, there are all forms of attractions, both of interest and of instructional merit, besides of course, places of entertainment that satisfy the mind's wish for the frivolous side of life. But the Science Museum stands out just as prominently as a place where hours and hours of the most interesting and useful study can be spent, at no cost whatever, and the impressions and lessons gained remain indelibled in the memory.

The reader's pardon must at once be asked for this presentation of facts about an institution that is distinctly British, from the very stones of its foundation; but as we here in America have no such place to turn to, either in the United States or in Canada, it must be at once admitted that this article simply gives its bare facts and reminiscences, for the benefit of those who may have had the good fortune to have seen this interesting building, and thus bring back to mind some pleasant thoughts; and perhaps it may be of interest to those less fortunate ones who, not having ever seen the Science Museum, would like to learn something about it.

To begin with, the idea back of the whole institution is to provide a permanent home for examples of all classes of practical engineering and mechanical appliances, so that these can afford the general public the opportunity of studying these machines and structures for instructional and educational purposes; at the same time preserving these examples for the benefit of posterity and future generations. The work of the Museum Authorities is thus endless, and the scope of their investigations is not only confined to the addition of new machines of modern construction and improvement, also of new inventions and improvements on old types of machines, but also the vast work of collecting, selecting and cataloging of every possible form of old time and historical machine that can be found. Thus it is that the place is always being added to and improved upon in order to house new exhibits, and of late years the growth has been exceedingly rapid. The original building has been added to and improved upon so much that little is left of the original home of the Museum.

Let us now take a ramble through its halls and corridors, and examine at first hand as many as possible of its thousands of glass cases with their wonderful displays.

The Museum is located close to Kensington Gardens, right next to the Natural History Museum (which is the Mecca for Naturalists and those interested in Animal and Bird Life of the World) and there are two entrances, one at the East End and the other at the West End of the building. Anybody will tell you how to get there. On entering the big West Entrance Doors, the visitor comes to a turnstile, which is the only formality necessary to enter the place.

Inside the turnstile, the first thing that greets the eye is a room devoted to exhibits relative to the Fishing Industry, and the exhibits are so complete, that anyone, supposing they did not know what a fish was, would be almost an authority on Fish and How They Are Caught, if they made a closer study of this room alone.

Here in one corner, we find large Tanks with Fresh and Salt Water Fish all sorts and Species, swimming about in them, alive and moving. There are also large Coloured Pictures and Plates close by with the names and descriptions of the various species of the principal fish of the world that are used Commercially, with all sorts of news and information of their habits and customs. An Attendant is always nearby to answer questions and point objects of interest out. Then in another part of the hall is a complete model of a Steam Trawler with her outfit and fishing gear. Then there is another Model of another Trawler at sea, with Her Otter Trawl Net let down to the Sea Bottom engaged in dragging the Denizons of the Deep by one of the quickest and humanest routes to the dinner tables of those who eat fish. There is also a Complete model of a Steam Herring Drifter, with her Drift Nets let out ready for fishing. There are Models of Long Line Halibut Fisherman, both sail and steam: models of Old Time Fishing Boats: Models of American, German, French, Dutch, Scandinavian, Chinese, Japanese, and in fact every country on earth's particular types of fishing craft, ancient, modern, sail and steam. There are nets and seines, lines and drags, Indian Canoes used by Redskin Fisherman, Fish Wheels and Weirs as used on the Western American rivers; hooks and lines; sporting outfits for fishing; models of Canneries; models of Fish Smoking Plants; models of Hatcheries: models of Refrigerator and Ice Plants used for Fish Storage: in fact there is nothing left unshown that is relative to the Fish Trade of The Whole World and the Fish and Fishes of the World, and Man's methods of catching them. All the Models are

(To be continued)

Junior Mechanics and Electricity, Vol. XI, principal contents, How to build a model undertype engine and boiler. A miniature electro-motor. How to make a horizontal sundial. Constructing a simple model steam locomotive. A cheap field telegraph set. A simple mechanical calculator. Cardboard model pacific tank locomotive. Making elementary electrical apparatus. Making model aeroplane propellers. Electric batteries. Building a model L. N. W. R. brake van. How to construct a simple spectroscope. A novel electric gun. Paper gliders. An electrically driven model motor launch. How to make a try-square. Tools and tool making for beginners. Building model boat hulls. Model torpedo boat destroyer. An electric hand lamp. Building a model destroyer. A cheap tool box. Simple telegraph set. A model hand power crane. A novel water clock. Making model engine parts from sheet metal. Toy making. A working model gas engine. Hints on keeping tools sharpened. How to make a 10-in. wimshurst machine. Making small boiler fittings. Casting simple bearings in type metal. An electric lighting set for a cycle. A simple testing cell and how to test with it. How to make a model siege gun. Notes on compressed air driven model aeroplanes. A simple solenoid electro-motor. A fret work machine. Electrical condensers. Notes on model railway construction. Calipers, and how to make them. How to make ratchet wheels. Model railway exhibit. A small model canal steamer. Constructing a small slide rest. Flying model aeroplanes. Home made pocket case of tools. Model railway station. Wooden Toy construction. A small paraffin blow lamp. Ladder of success. Our post bag. Answers to correspondence, etc. Title and index, 268 pages, fully illustrated, in numbers, $1.75 postpaid. Spon, 120 Liberty Street, New York.

Mr. Frank Birch has sent us a finished cylinder for his 2½" scale locomotive for us to examine. It has a piston valve. The proportions are very good and the workmanship is of a very high order, just as good if not better than the finest foreign made article, and we have had a good many imported ones through our hands. If our modelmakers go on turning out work like this, our products will compare with any foreign made models. We shall be very pleased to show this cylinder to any of our readers who may be in our vicinity.

The Bathe Mfg. Co. report that they have revised and enlarged their illustrated catalogue, adding to it a number of new items. An oscilating engine, also a slide valve model. These two engines are complete with boilers and all the necessary fittings. They also have in preparation a larger sized single cylinder stationary engine, with a cylinder bore of 1½" and 2" stroke. There are two fly wheels 7" dia. With 50 lbs. of steam it will develop about ⅛ H. P. Many small fittings and supplies have also been included in this new catalogue which is just off the press.

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2 in. x 4 in. Steam Engine, for $30.00, in good condition. Ralph Luther, Hope, Ind.

Half Inch Scale Pacific Locomotive castings. The ideal set for the beginner, reasonable prices on machined parts. List for 2 cents. Frank Birch, General Delivery, Highland Park, Mich.

Vertical and Horizontal steam engines and boilers, various sizes all new. Bray, 35 Summit Ave., Jersey Ctiy, N. J.

Patterns—Wood and Metal, Models and Small Castings. Special attention to modelmakers wants. J. H. Koch, 103 Summit Ave., Linwood, Pa.

Blue Prints of Ships for Modelmakers, send for circular. G. B. Douglas, 165 Summit Ave., Upper Montclair, N. J.

Blueprints—Design for—Scale Model of Twin-Screw Yacht. 1 Profile and deck plan, size 13″ x 22″. 2. Lines, three views, 7½″ x 23″. 2 sheets price $1.25 post paid. Spon, 120 Liberty St., New York.

Mr. Roy Ashley, 236 Edna Street, San Francisco, Calif. is making preparations for the formation of a Model Engineers Club. There are many Modelmaker readers in California and we ask every one of them to get in touch with this gentleman and find out what Mr. Ashley's plans are.

Just before going to press we hear from Mr. S. C. Swanson that the Annual Exhibition of the Chicago Society of Model Engineers will be held at 844 Rush Street, Chicago, Ill., the last week of October. Get in touch with Mr. Swanson, 7826 Coles Ave., Chicago, Ill., and get all the latest particulars. Interest your friends and be sure to go and see this Exhibit.

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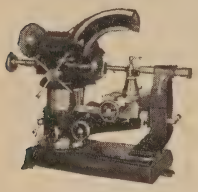

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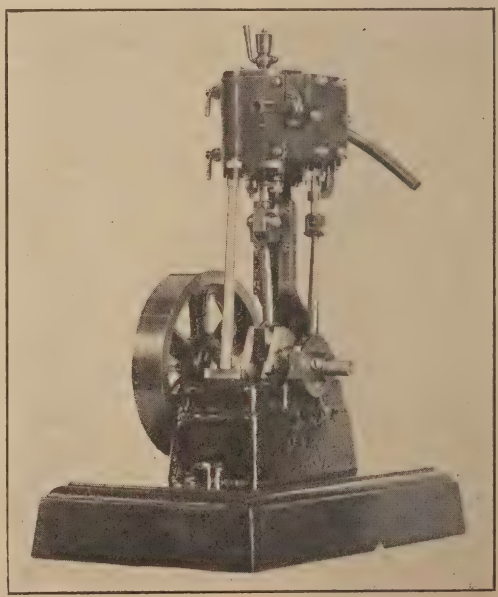

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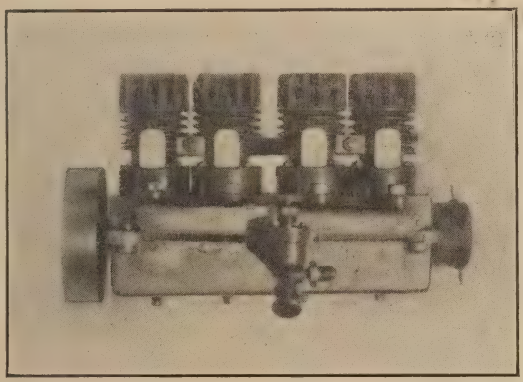

4-CYLINDER GASOLINE ENGINE, 2-CYCLE, AIR COOLED

Designed and built by Mr. P. J. Fortin (see page 164)

12″ overall, 6½″ high, 5½″ wide, total weight 17¾ lbs.

THE MODELMAKER

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OUR FOREWORD

The two oldest known sources of power are wind and water—hydraulic.

Wind power was used in very early times as a means of propelling boats. In King Tut's tomb were found models of Nile sailing boats. The origin of sail power is lost in antiquity. Perhaps its use was first applied by the Chinese.

Water power — hydraulic — was used in a primitive manner, in early times, as a means for raising water from one level to a higher level. As instanced in the use of the Arcamedian screw at the end of which was a small water wheel partly immersed in a flowing stream. The power of the flowing water turned the wheel revolving the screw which conveyed a thin stream of water up an incline plane, discharging it into irrigation ditches.

Later on we find the windmill reaching its highest development in Holland, where it has been used extensively for pumping purposes, and milling for many years.

Both of these sources of power have been extensively used in Europe.

In recent years Hydraulic Power has been more extensively and scientifically applied than ever before and the field for its use is broadening out every year. As a means of generating cheap electric current it has no equal. Once the installations are made the cost of maintenance and up-keep is nominal in comparison with the up-keep of steam or internal combustion installations. The writer believes it will be the greatest source of cheap power in the near future.

The practical use of tidal power is one of the great problems before the engineering profession today. Two such projects are being even now considered. The impounding of the tidal waters of the River Severn, in Great Britain, and a similar project in a portion of the Bay of Fundy. The cost of the necessary dams and installation will be very high, but the enormous output of cheap electric power, conveyed by high tension transmission lines, over great distances, will revolutionize forms of power production. It will mean cheap electric current for lighting, heating, cooking, and all power purposes.

There will only be one real competitor—gas power. Coal turned into gas at the mine's mouth, utilized in the gas-

electric installation and the cheap electric current thus produced will be delivered over high-power transmission lines.

The gas engine, in this country, has been rather in the discard for the past twenty years. But here is a field for the scientific investigator. The development of the present gas engine into a machine that will produce more power from every 1000 feet of gas consumed than has ever been produced by any known type of gas engine.

We have published several articles on the construction of small gas engines. We should like to hear from more of our readers who have designed and constructed gas engine models. The Scientific Modelmaker may well devote some of his spare time to this interesting subject.

MODEL OF U.S.S. WYOMING

By Mr. John Baur

An illustration of this fine model will be found on the front page of the Modelmaker for September. This model is 4 ft. overall, on a scale of 9/16" to 1' 0". The hull is constructed on the bread-and-butter method, and dug out after the outside has been worked down to the correct lines. The deck is movable to allow of easy access to the machinery. The armament is twelve 14" guns, in revolving turrets, and twenty-one 5" guns, on the lower deck.

The boiler is of an unusual type, consisting of four 1" diam. tubes at the bottom, cross connected by means of a number of ¼" copper tubes, and a fifth 1" tube at the top suitably connected to the bottom set, to serve as a steam drum. The bottom tubes are 6" in length, and the steam drum somewhat shorter, all being of No. 20 ga. brass. All the joints are silver-soldered. Heat is furnished by an alcohol lamp with four long wicks running practically the length of the boiler.

Two ½" by ⅝" single cylinder, double acting, piston valve engines, geared together with the cranks 90 deg. apart, and connected direct to two screw propellers, provide the motive power. Both units are reversed by means of a single four-way valve. A boiler feed pump is geared to the engine shaft, which also drives a small bilge pump to keep the hull clear of water. All parts of the model, with the exception of the pressure gage are the work of Mr. Baur.

Although the model has not had a test on the water, it is estimated that with 40 lb. steam pressure it should make about 8 miles per hour.

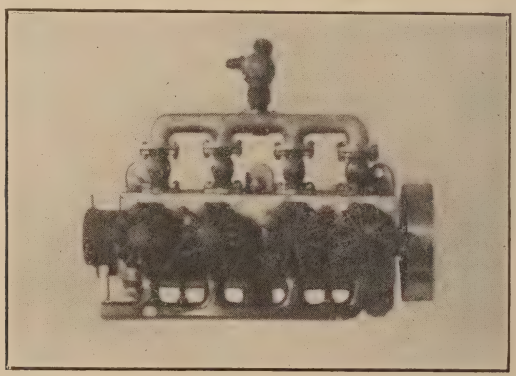
Mr. Volney F. Crouch, 530 West Oak Street, Roseburg, Ore., is very much interested in model work and would like to hear from any fans in his vicinity. He writes that his present workshop is in a damp basement but he is planning to erect a real workshop in the Spring in the rear of his house. It will be 16' x 24' x 12' to ceiling, which means light and air and plenty of room. His principal tool is a 11" South Bend Motor Driven Tool-room Lathe, but he hopes to add quite some equipment to his new shop in the spring, and we wish him every success.

4-CYLINDER GASOLINE ENGINE 2-CYCLE, AIR COOLED

By P. J. FORTIN

I am sending you several snapshots of a 4-cylinder, 2-cycle Gasoline Engine I have just finished as I believe it will interest many of the Modelmaker readers.

The model is 12″ overall, 6½″ high, 5½″ wide and weighs 17¾ lbs. I made all the patterns myself as I am a pattern maker by trade. The cylinder heads are detachable. There are five main bearings. The work occupied my spare time during a period of eight months.



General Specifications

Cylinders—4 separate castings, semi-steel.
Bore 1″ x 1¼″ stroke.
Main bearings, high speed babbit.
Crank shaft, cut out of solid piece of nickle steel 2″ x 12″ x ⅝″.
Crank case, aluminum.
Oil pan, aluminum.
Pistons, aluminum, each with 2 rings of semi-steel.
Connecting rods, phosphor bronze.
Wrist pins, 3/16″.
Fly wheel, cast iron, 4″ diam., 1¼″ face, weight 2 lbs.
Exhaust and manifold, cast iron.

Check valves, 4, used with one carbureter.
Kind of carburetor, Uberflug.
Cylinders bolted on to the crank case with stud bolts.
Timer, turned out of solid block of fibre with the segments set in. Has a roller contact similar to the Ford.
Length of engine, overall, 12".
Height of engine, 6½".
Width of engine, 5½".
Total weight of engine, 17¾ lbs.
Started by spinning fly wheel.
Ignition, Ford spark coil.
Spark plugs, in head of cylinders.
Batteries, storage.

The illustrations give a good idea of the general appearance of this very compact engine.

I only used rough drawings but if any of the modelmaker readers would like to secure a set of the castings I could supply them and I would have a proper set of tracings made by a draftsman so I would be able to supply blue prints.

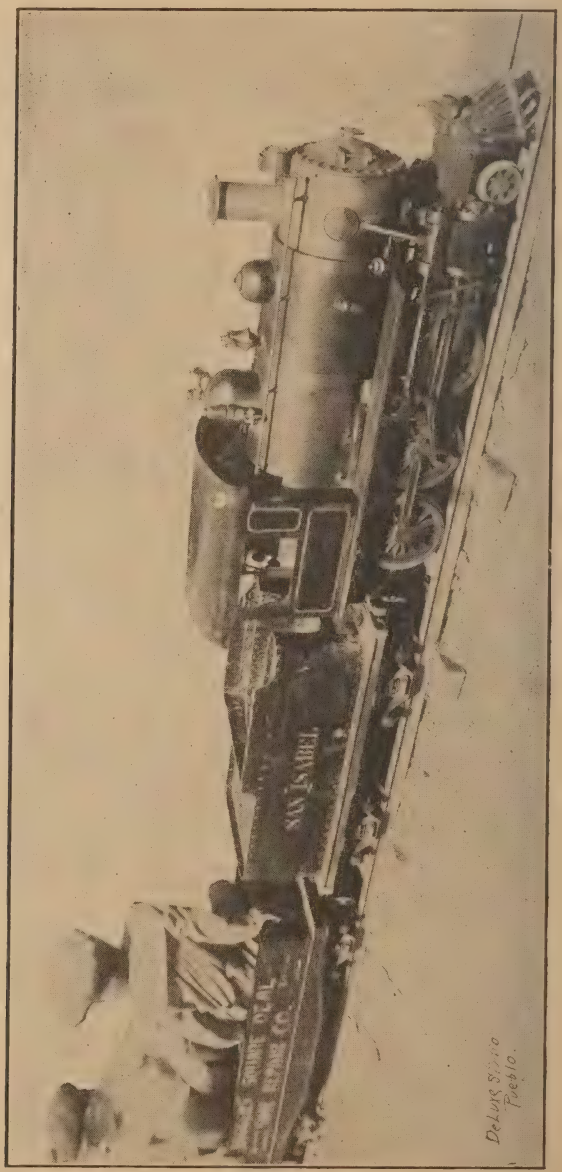
I built this engine for experimental purposes and have tested it out running light. Its performance being extremely satisfactory.

The Model Railway News, principal contents for September and October numbers. Mr. W. R. S. Smart's Model Railway System. An "O" Gauge Goods Yard Craine. Munich Miniature Railway. Mr. G. S. B. Rees' Canadian "O" Gauge Model Railway. Mr. G. F. Vollmer's 1¼" Canadian Electric Railway System including two of Mr. A. W. Lines Coal Cars. The Rail Planning Competition. Cardboard Modelmaking. "OO" Gauge Wagon Bogie. Mr. E. Beal's "OO" Gauge Model Electric Locomotive. Model Railway Bridges and Stations. New Electro-Motor Mechanism. Our Mail Bag. Queries and Replies, etc.

BOOK REVIEWS

Two Stroke Motor Cycle—Third edition considerably enlarged, 185 pages illustrated, 7¼ x 4¾ in., boards, $1.00.

The rapid development of this type of motor cycle has made it necessary to revise and considerably enlarge this practical hand book. A large amount of really interesting and practical information is crowded between the covers of this handbook. The numerous and varied illustrations and diagrams considerably increases its value to the man who wishes to know all about the two stroke motor cycle engine, its care, repair, maintenance and operation. The book is well worth its price.


SANTA FE
DeLUXE STUDIO
Pueblo.

4—6—0 PASSENGER LOCOMOTIVE

1½" Scale, 7¼" Gauge

By MR. WM. L. DANEY

I am sending you this description of my locomotive which I practically finished in time to run it at the Colorado State Fair this Summer, where it was in successful operation for six days. The track was a loup of about 600' 0", containing a grade of about 200' 0" rising 18" to 100' 0" with a 10' 0" radius. Besides the locomotive I had nine flat cars. The heaviest load was nine large men, and many trips were made with from twenty to twenty-five children. A speed of 15 miles per hour was attained.

The track was not ideal as it was poorly laid and the rail heads were rather large for the tread of the wheels, especially the smaller ones.

The engine held the rails very well, only slipping a bit when the rails were wet.

For fuel I used lignite coal and was able to keep steam up to 100 lbs.

The air breaks for tender and engine will be fitted this winter with the pump to work them.

The head and tail lights are electric, and are supplied with current from a battery placed on the tender at night time for that purpose.

I also intend to change the valve gear, from slide valve to piston valve and make a few other minor changes, which I believe will increase the efficiency of the engine.

General Specifications

Type of locomotive—Free lance passenger, 4—6—0.
Scale, 1½", gauge 7¼".
Cylinders, 1⅞" x 3".
Size of piston heads, ⅞", each with 2 rings, 3/16" wide.
Type of valve gear, Walschaert.
Valves—D. slide made to look like piston valves.
Valve travel, 7/16", 2 bar guides, cast cross-head with taper.
Wheels, drivers, 15 spokes, 7½" diameter.
Wheels, pony truck, 8 spokes, 3" diameter.
Wheels, tender, cast drum type, 4½" diameter.
Wheel base, rigid, 17".

Wheel base, total 31½".
Key into piston rod.
Kind of firebox, steel, locomotive type.
Grate area, 12" x 5".
Kind of fuel used, lignite coal.
Boiler, 9" diameter, 34" long.
Flues, 16, ⅞" x 14" long, steel seamless tubing.
Boiler, welded throughout.
Boiler, fitted with super-heater.
Steam dome, 5" x 4" diameter.
Boiler pressure, 80 lbs., raised to 100 lbs.
Tender, square backed type, holds 13½ gal. of water.
Length of engine, 42".
Length of engine and tender, 7' 10".
Height of engine from rail to top of smokestack, 23".
Width of beam, 14½".
Weight of 4 wheel truck and bolster, 22 lbs.
Wheel base of truck, 8".
Water fed to boiler by injector.
Couplers, link and pin.
Height from rail to centre of couplers, 4½".
The illustration shows engine with one of the flat cars.
Same style of trucks used with tender and flat cars.

The Model Engineer, principal contents for August 20th to September 24th. Two adjustable Slide-rest Tool Posts. A Small Swivelling Jaw Machine Vice. Non-condencing Beam Engine. Exhibition of Specimens of Metal Turning. The Indicator in Work-Shop Use. A ten-cell Compound Electromedical. Constant Current Battery for Ionization. Walchearts valvegear. A very Old Single Cylinder Steam Engine, 1797. The Possibilities of Electrical Switching. Cylinders for Compound Marine Vertical Engine. Steam Tables. A toolholder for Screw-cutting. Construction of a Twin Horizontally Opposed 2" x 2½" Petrol Engine. A Small Gas Engine Electric Lighting and Charging Plant. A Geared Bench Grinder. Experiments in Spinning Metal. An Outdoor 11/16" Scale Model Railway. Electrically Driven Private Refrigerating Plant. Shop, Shed and Road. Model Marine Notes. Yachting News. Recent Inventions. Models at the Railway Centenary, 1925. Locomotive News and Notes. The M. E. Electric Clock. Queries and Replies. Correspondence, etc., etc.

A MECCA FOR MODELMAKERS

By GEO. A. CUTHBERTSON

(Continued from page 157)

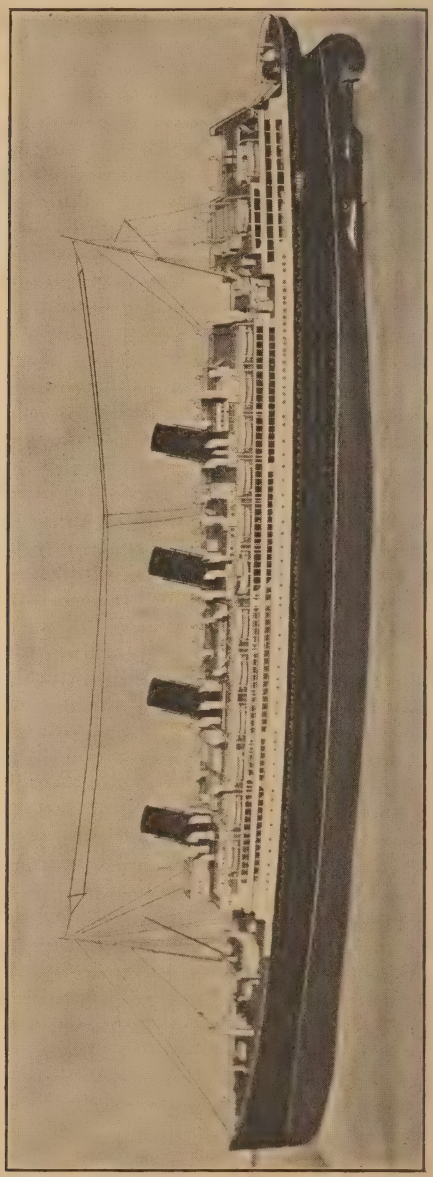
made to scale, and are beautifully finished in all their natural or actual colours, and they are a study in themselves. The Trawler and Drifter Models are most ingenious, as they show the vessel as though she were actually floating on the water, (which is made of Glass), with the view of the Sea Floor and all its irregularities. It is quite fascinating to see these tiny ships, calmly floating there as it were, in their glass cases, complete in every detail even to the cook's galley stove pipe. The whole display is tastefully arranged, with no impression of being crowded or overdone.

As we could spend a full week in this room alone we must go on to the next section, which is even more interesting to some, namely the Aviation Section. (All these are on the Ground Floor.)

Though this section is the most Modern, it is most comprehensive, and though there are a great many more Models and Machines yet to be added, yet the present display would take weeks to examine closely and methodically. To describe it is even more difficult than the Fisheries Section.

Here we find Models of every class of Heavier Than Air and Lighter Than Air Machine that have ever been built. There is a Model of Langley's Machine, Graham-Bell's Machine, The Wright Brothers' Machine, Santos-Dumont's Machines, Farnham's Machine, Bleriot's Machine, The Antoinette Aeroplane, all kinds of Gliders, Zeppelin's, Airships of various types, American Airships, British Airships, German Airships, Models and actual full size engines for Aeroplanes and Airships. In fact everything from the Earliest Balloons to the most Modern Type of "Bomber" and Rigid and Non-Rigid Airship that now exists, There is also one very interesting exhibit, namely the actual machine used in the first Trans-Atlantic Aeroplane flight, flown by Alcock and Brown in their historical non stop voyage. There are all kinds of pictures and diagrams and plates of every class of aircraft that has ever existed, or was ever devised, if not actually constructed. There are also hundreds of other exhibits and models of Hangars, Flying Fields, parts of Airships and Aeroplanes, Hydroplanes and their appurtenances. Attendants are also present to answer questions and show you around. There is really nothing left unshown relative to Flying

(To be continued)



THE S. S. AQUITANIA

By J. W. C. CORBUSIER

Replying to your request I send you the following particulars of my model of the Cunard Liner S. S. Aquitania. This is a scale model and its construction occupied a good deal of my spare time for nearly two years. I have had it in the water a number of times and have found it very seaworthy even in some very rough weather, but up to the time of writing I have not made any actual test as to its speed.

The upper decks are made to lift off to enable me to get at the motor and batteries.

General Dimensions

Scale of Model, ¾" to 20' 0".
Length overall, 5' 6".
Depth from top deck, at midship, 7¼", beam 7⅛".
Weight of boat, 14 lbs.
Weight of batteries, 9 lbs.
Total weight of Model, 23 lbs.
Material used for hull, white pine, one solid piece.
Type of construction, dugout.
Power plant, Knapp 12 volt electric motor.
Storage batteries, glass jars about 2¼" high with rubber covers.
Propellers, 4, 4-bladed.
Drive, chains from motor to propeller shafts.
All deck fittings are to scale.
Boats, 26 life boats, 2 motor boats, 54 life rafts.
Davits, made of aluminum wire for lightness.
Ventilators, about 60 of various sizes.

The cargo winches being so small were made out of pieces of cardboard pasted together and given several coats of paint.

The ventilators are made of heavy gummed paper, cut into strips, moistened with water and moulded around metal patterns, the patterns being carefully removed when ventilators were dry. These were made in this way to save weight and prevent the model becoming top-heavy. The stockless anchors are whittled out of wood as there were no metal ones to be had of that particular shape and size.

The underbody is painted red, the sides black and the upper works and boats white.

The smokestacks are painted red with a black band at the top, the Cunard colors.

CORRESPONDENCE

J. R. T., Shrinkage of Castings. The pattern maker's rule for shrinkage is as follows: Cast iron ⅛; brass 3/16; lead ⅛; tin 1/12; zinc 3/16.

M. P. S., Yes. Iron castings should be cleaned of all sand and scale before being machined. There are three methods in common use. The sand blast, especially used on large castings; the tumbling barrel for medium sized and small parts; and the acid, or dip, process. There are two kinds of acid used, sulphuric acid, and hydofluoric acid. For small iron castings we should recommend the sulphuric acid pickle, which should be kept in earthenware crocks, glass jars, or wooden tubs. The proportion is one part of commercial sulphuric acid to 10 parts of water. Put the water in the tub, or crock, first, then add the acid slowly, stirring the liquid thoroughly until it is well mixed. Be careful not to splash any on your clothes, or body as it makes a bad burn. The castings should be immersed in this pickle and left until the scale, or sand, is easily removed, then wash the castings well in hot water. To make sure that all the acid has been neutralized immerse the castings in a hot saturated solution of common soda and stir them about in the liquid with a piece of stick long enough to get them heated up. Then remove the castings from the solution and place them upon newspaper to dry off. Iron castings treated in sulphuric acid pickle, when dry, take on a dull, or black, appearance. Have a bottle of lime water handy in case any of the acid is splashed onto the hands. Use the lime water liberally on the part affected and then wash well with soap and water.

Mr. F. R. Pope of Bayonne has just completed the fitting up of his workshop, which includes a star lathe, he has decided to build a ½" scale, 2½" gage, Birch Pacific type locomotive.

Mr. C. O. Liljegren, 38 North St., Quincy, Mass., would like to get in touch with model locomotive makers or enthusiasts. He has invented a directly driven Diesel Locomotive of which he intends to have a model made.. He is wondering if any of our readers ever tried models of Diesel Engines which by their relative simplicity (no burners, spark plugs nor carburetors) should make the ideal power source of models. He has invented a new type spray nozzle which in actual test by manufacturers was found to be by far the best ever tested by them. He thinks that although Diesel machinery is comparatively new, as a source of power, its manufacture and operation are well known, and the time seems ripe for Diesel Models, certainly a most interesting hobby.

Frank Birch writes that several letters sent him were returned to writers insufficiently addressed, mark them General Delivery, Highland Park, Mich.

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Dynamo and Motor Construction.
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120 LIBERTY ST. NEW YORK

Mr. Whitney is building an Electric Locomotive (free lance type) to ½" scale. He secured a set of finished wheels from The American Model Locomotive Co. and is very well satisfied with Mr. Ashley's work.

Mr. Wm. Hojohn, 229 Division Street, Amsterdam, New York, devotes his spare time to model locomotive work. He would like to hear from any one in his locality interested in modelmaking.

Mr. J. F. Gerken, 95 Elk Avenue, New Rochelle, N. Y., is much interested in the construction of model sailing yachts. He would like to hear from any of our readers in his section interested in this delightful hobby.

Pacific Locomotive Castings, $30.00 per set, including drawings.
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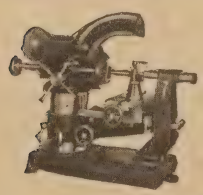

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½" Scale Steam Model, K 4 (Pacific) Pennsylvania R. R.
We have many customers busy on this fine model; are you one of them? We can supply rough castings, or do any machining for you, and our deliveries are prompt.
OUR ⅝" x ¾" VERTICAL PISTON VALVE ENGINE would make a beautiful gift for your boy. Supplied rough, or machined, with all materials.
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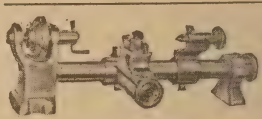

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Capacity: 4" dia. x 12" length.
Turning, Facing, Boring, Drilling, Winding, Thread Cutting
No. 1 Plain Machine as above $28
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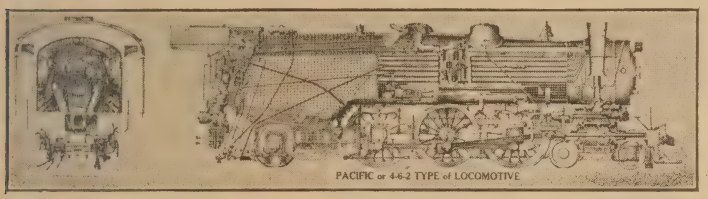

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Large Sectional Drawings showing every part numbered and named of the following:—American, or 4—4—0 type locomotive; Micado, or 2—8—2 type locomotive; Consolidated, or 2—8—0 type locomotive, with Walschaert valve gear; Atlantic type locomotive; Passenger and Sleeping Car, each of these 25c. Freight Box Car, 35c; Gondola Car, 35c; Pacific, or 4—6—2 type locomotive, size 44" x 17", 50c.

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Castings For Vertical Stationary Steam Engine

1" bore x 1" stroke

Set of rough castings in soft iron include all steel stock, screws, stock for crankshaft, packing and detailed blueprint.

Price of complete set for this engine (in iron) $10.00.

In hard bronze $14.50.

Finished engines are not supplied except on special order.

Height of the engine 8"
Diameter of flywheel 3¾"

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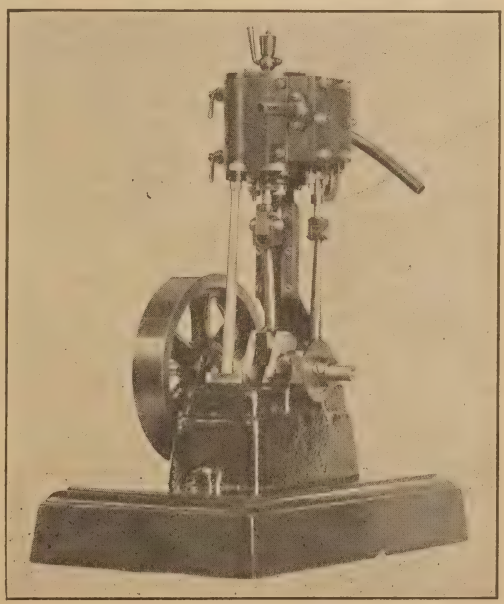

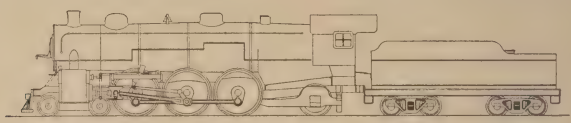

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PRICES—Set castings and materials, erecting and detail drawing, $15.00; erecting drawing only, $1.00. Write for prices of finished separate parts.
AMERICAN MODEL LOCOMOTIVE CO., 236 Edna St., San Francisco

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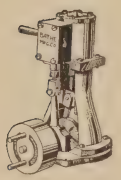

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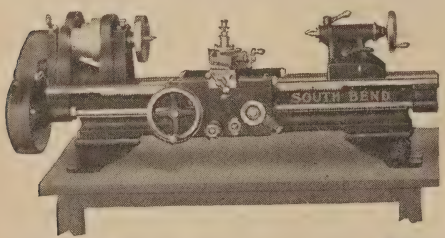

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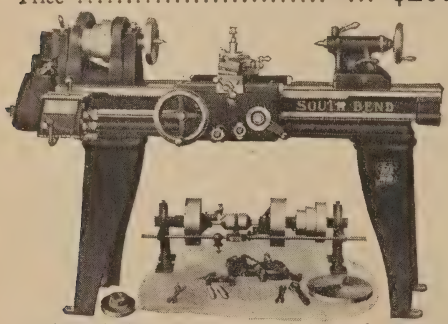

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THE MODELMAKER

FOR THOSE
INTERESTED IN MAKING
WORKING MODELS

Vol. II, No. 12 December, 1925 10 cents

U. S. S. FRIGATE "CONSTITUTION"
"Old Ironsides"
Carrying 55 guns, with a crew of 500 men, displacement 2,200 tons

THE MODELMAKER

Published by SPON & CHAMBERLAIN

120-122 LIBERTY ST., NEW YORK, N. Y.

Issued Every Month *Annual Subscription, $1.00*

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Vol. II. No. 12

"Entered as second-class matter Mar. 27, 1925 at the Post Office at New York, N. Y. under the Act of March 3, 1879."

OUR FOREWORD

The publication of this issue completes the Second Volume of the Modelmaker. In glancing through the different numbers we realize that this magazine has not been as helpful and as complete as it might have been. At times it has been difficult to get sufficient new material to fill the current issue as we have studiously avoided the scissors and paste pot, our one desire being to give only original articles describing models our readers have constructed.

We could have turned to the foreign Modelmaker papers for articles to reproduce but that is not our policy. We know that there are many fine examples of Model work being constructed in this country that fully equal if not excel any like work produced in other countries, but our Modelmakers are not always prepared to write us about their work, or ready to give us the particulars and necessary data to be put into readable shape. Not that they do not wish to do so, but other duties or business prevented them from giving the time necessary to write down the information required.

We very much appreciate the many helpful letters and words of encouragement we have received and we want to thank all those gentlemen who have contributed articles and data descriptive of their work. We believe that what has interested them and afforded them enjoyable recreation will also interest others.

Some of our readers have commented on the amount of space we have given to model locomotive work, but the fact remains that many of our readers have constructed or are building locomotives and from these men have come the principal articles.

Others have complained that they consider much of our work too technical. Our answer is that we are devoting the best of our energies to the development of Scientific Modelmaking and have not any space to give to the description of mere toys.

The development of Scientific models, means thought and care, infinite patience and perserverence coupled with skillful workmanship. Something that is instructive as well as constructive, a fuller understanding of the principles governing the successful operation of a piece of mechanism.

To our readers who have been disappointed in not finding ar-

ticles descriptive of their particular hobby we say, "Send us in the particulars and a photo, or a drawing, of your model and we will gladly publish it."

We would like to devote a column each issue to correspondence, useful hints and tips, questions and answers that would be of practical interest to our readers. Also to hear occasionally from the Secretaries of the various Modelmakers Clubs and Societies as to their activities.

We want to thank our advertisers for their support and we hope that they have received their due reward.

We have a printed list of our advertisers and will gladly forward a copy to anyone who will send us a stamped and addressed envelope.

In closing we wish you all A Merry Christmas and a bright and prosperous New Year.

Mr. J. W. Neptune, 130 Paul Court, Akron, Ohio, and several of his friends, all model enthusiasts, would very much like to get in touch with all those who are interested in modelmaking within twenty miles of Akron. They feel that amongst the many mechanics employed in the different industries in this section there must be a number who have already been interested in model work or, who, if they had the opportunity would like to take up modelmaking as a pastime. Mr. Neptune would be very pleased to hear by letter or to see them personally anyone who would like to join him in forming a Model Engineers Society for mutual benefit and for the development of model making. There are a good many readers of this paper in Ohio and we hope that all those who can will get into correspondence with Mr. Neptune at once. Every time a new set of men get together, with this object in view, it is another stride towards our goal, which is the creation of little gatherings, or clubs, in the cities and towns which will be eventually linked up into the formation of a National Organization of Hobbiests.

One of the principal features of the American Marine Exposition recently held in New York was the Boy Scout Ship Model Contest in which 100 models of famous clipper ships, Spanish Galleons and Sloops of War were centered. The winner of the first prize (a round trip to Europe on the Leviathan) was S. Favovitch of Troop 190, The Bronx, N. Y., with a fine model of Columbus' Flag Ship the "Santa Maria." The winner of the second prize (a round trip to Florida) was David Mitchell of Troop 3, of Caldwell, N. J. The third prize, (a voyage on the Great Lakes) was won by Theodore Reynolds, of Troop 5, Larchmont, N. Y. A special award for the best constructed model was made to B. Roos of Troop 8, Elizabeth, N. J., for an elaborate model of the bark "Hebe." A Danish East Indiaman of the eighteenth Century. This Model was not eligible for a prize as its construction was commenced some months before the contest started.

PISTON VALVES

For 'O' Gage, New York Central, Pacific Type Locomotive.

By ROY ASHLEY

The following is an account of an experiment, with a 3/16" diameter Piston valve, for an 'O' gage, ¼" scale model, New York Central, Pacific Type locomotive.

Until quite recently, Piston valves for locomotives as small as ½" scale, were not considered practical, but this has been proven to be incorrect.

The writer until now, has always made cylinders with slide valves, with the exterior of the cylinder castings made to resemble the Piston valve cylinder.

The disadvantage of this method, is that the cylinder must be made in three pieces, which means a greater amount of labor machining and assembling.

For this reason the writer decided to experiment with a Piston valve for 'O' gage models. It was decided to use a valve liner which was made from cast phosphor bronze, this was turned to diameter, and a number 13 drill run thru, and cut to length, the port holes were then drilled across.

The liner was then reamed 3/16" and lapped in the lathe, a piece of soft brass rod was used as a lap, pumice and oil was used as an abrasive.

The valve was turned from German silver rod, to 1/1,000 larger than the finished liner. The outside lap for the valve was made from 5/16" dia. soft brass rod, a piece was chucked and drilled with a number 13 drill, and cut off one inch long. This bushing was then slotted down its length on one side, with a fine saw blade, then placed in the lathe and reamed 3/-6", by opening the chuck jaws slightly, the bushing expanded enough to admit the valve.

The lathe was started and pumice and oil placed on the valve, and run back and forth thru the lap, as the valve ground smaller, the lap was made smaller by giving the chuck jaws a slight turn, and so on, until the valve, after cleaning off the pumice, could just be pushed into the liner.

The valve and liner were then finished off by pushing the valve thru the liner with oil, a few times. They were then wiped dry, so that no oil remained, and the valve placed in the liner, and were found to be quite tight.

The valve was then connected to a boiler, and when the pressure reached fifty pounds, steam was admitted to the valve, which held back this pressure without leaking.

If a good sized displacement lubricator is fitted to the loco, and the valves carefully fitted by lapping, good materials used, piston valves of this size should remain tight for a great many engine miles.

The Modelmaker for 1924, (Volume 1) and 1925 (Volume 2) can both be had bound in cloth gilt. We would suggest our subscribers return to us their numbers and secure the bound volumes (see adv.) these bound volumes would make excellent 'Xmas presents.

MODEL OF U. S. S. CONSTITUTION

BUILT BY MR. GEORGE H. STEGMANN, M.E.

The prototype of this model was a famous Frigate of the U. S. Navy that earned the nickname of "Old Ironsides" because she was so massively built and her timber was so hard.

The plans for this vessel were prepared by Joshua Humphreys, Naval Architect of Philadelphia, in 1794, and approved by the Naval Authorities in Washington.

She was built at Hartt's Naval Yard, at Boston, Mass. Her keel being laid in 1794, but owing to many delays the hull was not launched until October 2, 1797. She was completed and commissioned for sea in 1798.

The hull was modeled from the best French practice of a line-of-battle ship, with approximately the same beam and dimensions for framing and thickness of planking, but with one deck less.

The framing was of live oak, planking of hard Carolina pine, and trim of Southern red cedar.

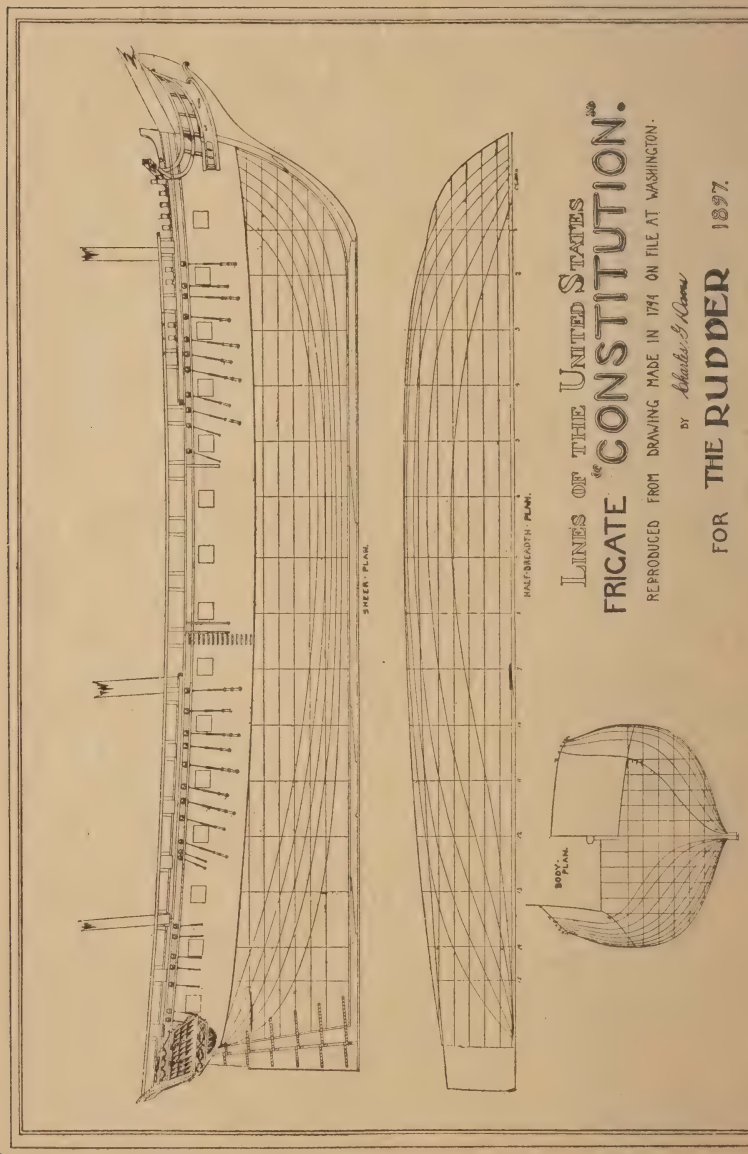
She was very heavily sparred, but owing to her great beam her masts were much better stayed than would have been possible with the beam of an ordinary frigate. She had tumble home sides.

The original figure head was what was known as a billet head, a full length figure of Andrew Jackson, being substituted during his Presidency but this was secretly removed by his political opponents and the billet head replaced.

This figure head of Andrew Jackson is in the possession of a Boston man and a press notice reports Mr. Henry Ford has made an offer for it.

MEASUREMENTS OF "OLD IRONSIDES"

Length over all, 204′ 0″.
Length on L. W. L., 175′ 0″.
Beams, 43′ 6″.
Depth of hold, 14′ 6″.
Draft forward, 21′ 0″.
Draft aft, 23′ 0″.
Tonnage, original measurement, 1576 tons.
Displacement, 2,200 tons.
Speed, 12½ knots.
Height of gun deck port sills from water line from 8′ to 9′, making it feaseable to use the guns on her gun deck in a


SHEER PLAN.
HALF BREADTH PLAN.
BODY PLAN.
LINES OF THE UNITED STATES
FRIGATE "CONSTITUTION."
REPRODUCED FROM DRAWING MADE IN 1794 ON FILE AT WASHINGTON.
BY Charles G. Davis
FOR THE RUDDER 1897.

seaway, which would not have been possible in an ordinary frigate, whose gun deck is much closer to the water line.

The copper bolts and spikes used in the construction of the hull were supplied by Paul Revere, forged from his own special formulae.

Capacity of fresh water tanks, 48,600 gallons.

Capacity of hold, room for six months provisions.

Original compliment, 22 officers and 378 petty officers, seamen and marines. Some years later the crew was increased to a compliment of 500 men.

During the war of 1812 the Constitution's battery consisted of

30 long 24-pounders on gun deck.
22 32-pound cannonades on spar deck.
1 long 18-pounder, bow chaser.
2 long 24-pounders, bow chasers.

This old frigate saw a good deal of service not only in home waters but also in the Mediterranean. She now lies in the Boston Navy Yard.

From a recent survey it is apparent that the hull is in very bad shape. It has been estimated that it will require about $500,000.00 to put her into fair repair. The U. S. Government has appropriated $250,000.00 for the purpose. A committee is trying to raise the balance of the money required by public subscription. It is hoped that the money will be forthcoming.

The illustration on the front page of this issue is from a painting by an unknown artist.

The two illustrations giving the lines and the sail plan are reproduced from "The Rudder" with the permission of the publishers as I believe these will add to the value of this article for any reader wishing to construct a model of this famous old frigate.

Mr. Ira N. Hollis book "The Frigate Constitution" is very interesting reading as it describes the different engagements in which this Frigate took part.

GENERAL SPECIFICATIONS FOR MR. STEGMANN'S MODEL

Model of the U. S. Frigate "Constitution" made from drawings furnished to me by the U. S. Navy Department.

Scale 3/16" x 1' 0" New York Yacht standard.

Length of Hull over all, 39 1/8″

Length on L. W. L., 35 5/8″

Beam, 8 3/8″

Length of model including Bowsprit, etc., 54 3/4″

Height of model from keel to truck, 45″

About 230 pulley blocks were used from 1/16″ to ¼″ long, single, double and treble blocks, also 180 deadeyes of various sizes.

Wheel, lifeboats, capstan, belaying bitts, anchors, sidelights, hatches, etc.

30 Guns on gun deck (dummies)

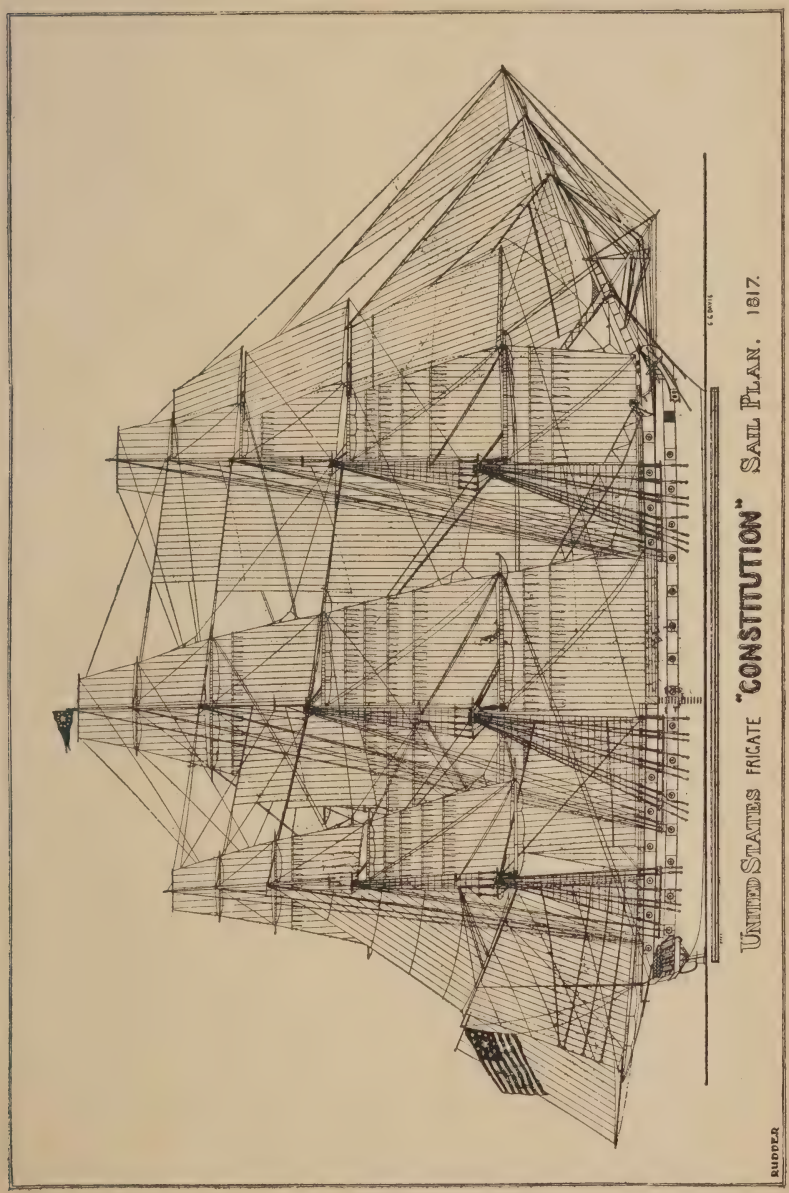
26 guns on spar deck, brass, wooden carriages.

Hull dug out of a block of white pine and shaped to conform with 30 cardboard templates.

Rigging, various kinds of fish line, silk and linen.

DIMENSIONS OF SPARS OF MODEL OF U. S. FRIGATE CONSTITUTION

Foremast—Height above deck, 13¾″; diam., 7/16″; banded.
Mainmast—Height above deck, 16¾″; diam., ½″; banded.
Mizzenmast—Height above deck, 12½″; diam. ⅜″; banded.
Fore Top Mast—Length over all, 10½″; largest diam., ⅜″.
Main Top Mast—Length over all, 11¾″; largest diam., ⅜″.
Mizzen Top Mast—Length over all, 9⅞″; largest diam., ¼″.
Fore Top Gallant Mast—Length over all, 10⅜″; largest diam., ¼″.
Main Top Gallant Mast—Length over all, 11⅛″; largest diam., 5/16″.
Mizzen Top Gallant Mast—Length over all, 8¾″; largest diam., 7/32″.
Fore Royal Mast—Length over all, 7½″; largest diam., 3/16″.
Main Royal Mast—Length over all, 9¾″; largest diam., 7/32″.
Mizzen Royal Mast—Length over all, 6¾″; largest diam., 5/32″.
Bowsprit—Length outboard, 7¼″; diam., 7/16″.
Jib Boom—Length over all, 8½″; diam., ¼″ and 3/16″.
Flying Jib Boom—Length over all, 12″; diam., 3/16″ and ⅛″.
Spritsail Yard—Length over all, 10¾″; diam., ⅛″.
Fore Yard—Length over all, 15¼″; diam., 3/16″ and 5/16″.
Main Yard—Length over all, 18¼″; diam., 3/16″ and 11/32″.
Mizzen Yard—Length over all, 14⅝″; diam., ⅛″ and ¼″.
Fore Topsail Yard—Length over all, 12″.
Main Topsaid Yard—Length over all 14⅝″.



UNITED STATES FRIGATE "CONSTITUTION" SAIL PLAN. 1817.

Mizzen Topsail—Length over all, 9½".
Fore Top Gallant Yard—Length over all, 8½".
Main Top Gallant Yard—Length over all, 9".
Mizzen Top Gallant Yard—Length over all, 6⅛".
Fore Royal Yard—Length over all, 5⅜".
Main Royal Yard—Length over all, 6¼".
Mizzen Royal Yard—Length over all, 4⅛".
Fore Skysail Yard—Length over all, 4 3/16".
Main Skysail Yard—Length over all, 4¾".
Mizzen Skysail Yard—Length over all 3".
Spanker Boom—Length over all, 11¾".
Spanker Gaff—Length over all, 9".
Studding sail boom on all yards on Fore and Main Masts.
Diam. of smaller yards ranged from 3/16" to 1/16".
The smallest diam. of upper end of mast was usually the largest diam. of the mast above it.

This model took about 650 hours to build and cost about $45.00 for material.

The Model Engineer, principal contents for October 1 to 29. A Working Model Cylinder Printing Machine. A Self-righting flying model. Model Paddel Steamer "Britannia." The Equipment of a Model Work Shop. Old Time Model Locomotives. Faults in Blow Lamps. Points in The Design of the Zbrorowski-Howey 15-in. Gauge Model "Pacific." Construction of Small Switches. A 60-Watt Dynamo. Marine Engineering During the Last Fifty Years. Clamp Fittings for Table of Drilling Machine. A Swiss Model Engineer's Work Shop. The Old Wylam Locomotive. Machining The Component Parts of a Small Power Petrol Engine. L. B. S. C.'s Articles on Locomotive Construction. Recent Inventions. Best Metals for Bearings. Light Engineering Equipment. Book Reviews. Queries and Replies. Society and Club Doings. Locomotive Notes. Model Power Boat Racing. Work Shop Topics. Practical Letters from our Readers. Model Marine Notes. (five numbers.)

BOOK REVIEWS

Ship Models, How to Build Them, by Charles G. Davis, naval architect, 184 pages, 165 illustrations and 20 full page plates, including lines and sail plan of the Clipper Ship "Sea Witch," 6¼ x 9½ inches, cloth, $5.20 postpaid.

Here is a book that many of our readers have been wanting for some time. It supplies complete instructions as to proper equipment and the various progressive stages to be taken in the laying out and construction of the hull and fittings, complete sail plan, a useful table of offsets and a belaying pin outlay for a clipper ship. A really practical manual for the builder of model ships.

A MECCA FOR MODELMAKERS

By GEO. A. CUTHBERTSON

(Continued from page 169)

by Man, and his machines. About the only thing not shown in this section are the Wings of Icarus, and I am quite sure that if poor Icarus could have paid the Museum a visit, he would have found a great deal of practical information in the Aviation Section, and probably would not have undertaken that fatal flight with his Eagle's Wings fastened on his back with Wax, as I believe they were. Also Mahommet's Coffin is not shown, but perhaps some day a model of it will be placed on display. However, there is a lot to learn there even if Messers. Icarus and Mahommet have not been represented.

After the Aeronautical or Aviation Section has been passed, we next come to the Marine Engine half of the Marine and Ship Section. The Marine Section is a very large one indeed, and is grouped in several very large Halls, both on the Ground and Second Floors. The most of the Exhibits are Scale Models, and they really represent the most wonderful single display in miniature, in the World. In passing it will not be amiss to mention still more about the Origin of the Exhibits. A few of the Models and Exhibits are Loan Exhibits, but the rest are either gifts or bequests, or have been purchased by the Museum Authority and are the property of the Nation. That is, this first mentioned group are all such Models or Exhibits as have been constructed by outside persons: the other group not yet mentioned, and by far the greater group, are those actually constructed in the Museum Workshops, by the Museums' own Model Builders and Mechanics. There does not seem to be a single job in the whole wide range of Model Making, that does not seem to have been attempted by the skilled workers of the Museum. This sounds like a very broad statement to make, but such is the case. No matter what may the subject, you will find that the Museum can produce a Working Scale Model of it, that is accurate and true to the prototype. The materials used in the building of these models cover as wide a range as the models themselves.

I have seen models of Gas Tanks, complete even to the nut heads, that could be inflated or deflated by the simple pressure of a Button. The finish and completeness is astonishing, and the only way I could actually give the reader a fair idea of how much work

is on a job would be to devote a series of articles on individual Models. It must also be at once admitted that the whole collection is priceless in its monetary value, instructional value and historical value. If the whole Modern world were to be buried up, and a new civilization spring up and start digging, should they find that the Science Museum was still intact with all its Machines and Models, they would be able to see at a glance just how we to-day carried out our existence in the mechanical line.

But having made this digression from our main subject, space demands that we pass along on our tour of inspection.

We find ourselves as said before, in the Engine Section of the Marine Exhibit. Here we find some actual working models of Marine Engines. There are models of Bell's and Fulton's engines, used in the famous Comet and Clermont, and also a complete set of models of the Engines, both Propellor and Paddle, of the unfortunate Great Eastern, the ship that astonished the world almost Seventy Five Years ago, and which was such a radical departure from established precedent, that we to-day, even though we are accustomed to the Leviathan and other monster vessels, must stop and marvel. The Great Eastern was almost as large as the White Star Liner Baltic, though she was built in the Fifties. She was so big that her builders did not know how to get her launched, and months were consumed in this job alone. After she was in the water she was so large that no dock could accommodate her, and from one cause and another became a financial loss to her owners, as far as passenger and freight traffic were concerned. But though she was a misfit in the then marine world, she seemed fated to render a service to the world, because on account of her immense size, she was used to carry and lay the first Atlantic Cable, which also was supposed to be the work of Madmen, but which has revolutionised the world of to-day. Thus at South Kensington the student of Marine Engineering can see the same engines that were used on the Great Eastern. When compared with modern engines they certainly look ponderous and unique. It might also be said in passing that the Great Eastern was both a paddle wheel and propellor vessel, and had the first Steam Steering Gear. The model of the Paddle engine is very large, and it is quite interesting to press the air button and see the huge paddles start to revolve, and watch the cylinders do their work.

There are working models of every type of marine engine in use, including the Parsons and Brown Curtis turbines. There are also models of all kinds of marine boilers, pumps, steam steering

gears, steam winches. There are models of Agricultural Machines, Bridges, Harbour Works, Mines, Smelters, Cranes, Derricks, Drills, Oil Wells, Gas Tanks, Cotton and Woolen Mill Machines, Sewing Machines, Looms, Warping Machines, Paper Mill Machines, Lumber Mill Machines, (In fact every Industry is represented) Gas Tanks, and I really cannot tell how many other models there are. Weeks could be passed in going over this room alone.

Then we go up to the Second Floor, and pass into the Mining Section. In this section there are models of all classes of Mines and Mining Equipment.

Then we pass into the Marine Section again, and as it is so vast, all that can be said is that there is either a Model or a Picture of practically every class of Ship or Vessel that has ever been floated, on any water, from time immemorial to the moment of writing. What makes this Hall all the more complete, is the presence of numerous Loan Models of present day Steamships, supplied by the principal shipping Interests of the World.

There is one more hall devoted to miscellaneous models of Patents, some of them representing machines that never got beyond the stage of the original model.

We have thus made a very hasty survey of the Royal Albert Science Museum, in South Kensington, London. Our trip should have proved of some benefit, and one of the facts that we must have at once observed, is that there is no such institution in America. Europe contains other such Museums, but none of them approach the grandeur of this one.

Of course, the cost is tremendous, but the good that it does for the benefit of the public, who after all help pay for it is not to be calculated. The fact that the collection is not a mere "Standstill" collection, but is always being added to speak for itself. In any case, the British Public at least feel that the money is well spent that goes to the institution. I also hope some time to give a description of some of the individual Models that comprise this collection, with their story. Steam capstans, donkey boilers, oil pumps, oil purifiers, feed water heaters, condensers, ice machines, refrigerating machines, and sections of shaft bearings, and all forms of rudders, paddle wheels, propellors, and gland boxes. In fact everything connected within Marine Engineering both Past and Present. The walls are also adorned with drawings and diagrams of all sorts of engines and boilers for ships.

After passing through the Marine Engine Section, we next come

to the Railway Section. This section is very interesting, even to a non-technical person.

Here we see all kinds of Models and Full size Exhibits of everything connected with railways. Here we see the old Rocket, this time the real Rocket, the Victor of Rainhill, the "Daddy" of all railway engines. Stephenson's Masterpiece lies here in state, and it is with a feeling of reverence that we look at the old veteran as it stands there on its little section of track, just as though it were telling the world that small things have big endings.

In addition to the Rocket, there is also an earlier locomotive of Stephensons, known as Puffing Billy. There are a couple of old Railway Cars, and samples of Railway Track, signals, wheels, and other relics. The models are very numerous, and there is one model of a locomotive in section that is specially interesting. The Railway section is as complete as all the other sections along the subject which it represents. It might also be mentioned that there is a model of the Brennan Mono-Rail Car, also of considerable interest. At one time it was expected that the Mono-Rail would become as popular as the regular line of railway, but such has not been the case.

Next we come to the Engineering and Machinery section, which is devoted to all classes of machinery and structures, and contains groups of models that as yet are not in sufficient numbers to have special groups and halls assigned to them. This room is practically all models, and there are about every conceivable form of machine represented possible to imagine, of how they were built, and all about them. It is also to be hoped that someday, and somewhere here in America, that such an Institution will be founded. There recently appeared in some of the Newspapers, that certain public spirited and wealthy men, and I believe the President of Messers Sears-Roebuck & Co., Ltd. was one of them, were speaking of getting such an institution established, but I have heard no more of it. However, if such is the case, a man competent in the formation of such an institute should be selected, as it will take considerable money and ingenuity to get the thing going properly.

As a final word, if any reader who has never yet been to London, ever does so, let him not fail to set aside at least a day or so to visit this Museum. There is a lunch counter right in the place (near the Railway Section) where a cheap lunch can be had, and thus saves the time required to go to the City for the Noon day meal. The place is also open on the Sabbath, for the benefit of workers who have no other day on which they can devote sufficient

time for a visit. I also hope that this description is not too long a one, but even then, I really do not think I have done the subject full justice.

Model Railway News contents of November issue, Dr. W. T. Dobson's "O" Gauge Electric Railway, Model Railways Abroad, 2½" Gauge Model Rolling Stock. A Reversing Clockwork Locomotive Gauge "OO" Scale 4 mm. Cardboard Modelmaking, Track Laying. Our Mailbag. Answers to Correspondence. With the Clubs. Sale and Exchange, etc., etc. The December issue will complete Volume 1 of this magazine. We can still apply a few complete sets from January to date. If you wish to secure one of these sets let us hear from you before they are all disposed of. Volume 2, will commence with the January, 1926, issue. This is without doubt the finest magazine devoted to Model Railway Work, especially the planning, layout, running and maintenance of private Model Railway Systems. It is really astonishing to find how many of these private systems there are in actual operation today, and we hear frequently of new systems being installed.

If any of our readers have duplicate copies of The Modelmaker for November, 1924, or May, 1925, return them to us and we will mail a sample copy of The Mechanical Boy in exchange.

Look over your numbers of Modelmaker for 1924 and 1925 and if you lack any of them order **now** to complete your Volumes before they are all sold, only 10c a copy.

"Glimpses of Old Time Railroading" is the title of a small pamphlet by Mr. Arthur Curran. In the preface he states he has two objects in view, to entertain those who are familiar with the subject and to stimulate the desire in others to take an interest in the wonderful development of the Steam Locomotive and to help them realize how much the prosperity of the U. S. has been due solely to the development of Railway transportation. There are seven illustrations of Old Locomotives. We have a few copies at 10c each postpaid.

Mr. Thomas Bray recently installed a South Bend Lathe in his workshop. He is a machinist and a Modelmaker of considerable experience and has built many different kinds of Models in the past twenty-five years. He is prepared to undertake any kind of fine machine work, or the construction of complete working or exhibition Models for any one who has not the facilities for doing this work himself.

A CORRECTION

The name of the contributor of the article on page 103, Dynamic Operation of a Locomotive was omitted by error. The author is Mr. Jas. G. Dunn, a member of The Canadian Model Engineering Club, of Toronto.

LOS ANGELES "EVENING HERALD" MODEL YACHT REGATTA

We are indebted to Mr. W. L. Gillespie, Pasadena, Calif., for the following particulars of the Third Annual "Evining Herald" Model Sailing Boat Regatta held recently at Westlake Park, Los Angeles.

The first year of these races (1923) there were fifty-five entries.

The second year (1924) sixty-five entries.

This year there was more than two hundred and fifty entries, a clear indication of the great interest being taken in this delightful pastime.

Much credit for the success this year is due to officials of the City School Department; Flag officers of the Southern Californian Yacht Clubs; Commodore Herman A. Williams, of the Los Angeles Model Yacht Club; and Instructors of Manual Training in the City Schools.

The management of the Races was placed in the hands of a number of the best known Southern Californian Yachtsmen, and under their able management this great meet went off without a hitch.

CONDITIONS FOR ENTRY WERE:

The boats to be built by boys under 21 years of age.

Every contestant to do all the construction of his own boat and to sail it.

Each contestant to be a resident of Los Angeles County.

Every boat to be officially measured before the race.

The "Evening Herald" presented a silver cup to the winner of each class.

"R" Class, boats 34" to 36" over all, sail area not to exceed 600 sq. ins.

"S" Class, boats up to 34" over all.

Fifteen elimination heats were sailed off. In the final heat fifteen boats faced the starter.

Ross Duncan with his 36" Sloop won first place in "R" Class. Alvin Meltzer, second; Harry Parkinson, third.

Lewis Sexton won first place in "S" Class. John Riggs, second; Donald Carr, third.

Commodore Ben. P. Weston of the C. Y. C., Chairman of the Southern Yachting Association, presented a trophy for the "Star Model Boat Race" sailed by eleven Flag officers. Won by Ray Schauer.

Another very interesting event on the program was the exhibition, under her own power, of Mr. T. E. Lander's model power boat. Designed after the famous Gar-Wood high speed motor boats.

In previous issues of the Modelmaker we gave some particulars of the Model sailing boat contests on the boat lake in Central Park, New York, and the "Marblehead Messenger" Model Yacht Regatta at Red's Pond, Marblehead, Mass.

Other contests have been sailed at Montclair, N. J.; Prospect Park, Brooklyn, N. Y.; Detroit, Mich., and Toledo, Ohio.

Never before in this country has such interest and enthusiasm been manifested in the construction and sailing of Model Yachts.

One reason for the popularity of model sailing boats may be the initial cost of materials, which is so small as to make it possible for the poorest boy to build and own a boat.

Model power boat building is not progressing so rapidly as more skill is required in building and operating them and the cost of the power plant is beyond the reach of the average amateur.

It is to be hoped that the time is not far distant when annual national model sailing boat contests will be held, which would still further increase the interest in this sport and help in the development of the finest types of model sailing yachts.

Perhaps some of our Western friends would like to get in touch with the Secretaries of the following Clubs with the object of planning for a national Regatta.

Mr. H. Griffith, 609 W. 147th Street, New York, Central Park Model Yacht Club; Mr. J. H. Hindman, Dept. of Recreation, 504 Elmwood Street, Detroit, Mich, Detroit Model Yacht Club; Mr. G. A. Heine, care Meilink Steel Safe Co., Toledo, Ohio, Toledo Model Yacht Club; Mr. G. B. Douglas, 165 Summit Avenue, Upper Montclair, N. J., Montclair Model Engineers Club.

There are two excellent works on this subject, Marshall's Model Sailing Yachts and Hobb's Model Sailing Boats. Mr. G. B. Douglas has a work in the press "The Rigging of Model Sailing Boats." Announcement of its publication will be made in the Modelmaker.

There have been a number of articles on the design and construction of model sailing boats with illustrations and sail plans, in the back issues of the Model Engineer, including designs of some of the most famous foreign Model Sailing Yachts, also some of the record making Model Power Boats.

There is also considerable interest being taken in the construction of models from famous oldtime sailing vessels.

Later on we hope to publish in the Modelmaker some more designs of model boats.

MODELS OF DONALD McKAY'S CLIPPERS

We have before us a most interesting pamphlet with illustrations of some very beautiful models of famous oldtime American sailing ships. The models themselves are the handy work of Mr. McKay Tiffany and they certainly deserve to be placed in one of our great national museums because they are replica of some of the most famous sailing ships built in the United States under the supervision of one of the most famous ship builders of his time, Donald McKay.

This master craftsman, who put his very soul into his work, produced some of the finest, fastest and most beautiful clipper ships the world has ever seen.

It was a scene to be remembered the meeting of one of these magnificent vessels on the high seas bowling along before a stiff breeze under a cloud of white canvas, every stitch drawing that she could carry. The following are the names of the ships illustrated in this pamphlet:

Ship "Courier," a packet of 380 tons built in 1842.

Ship "St. George," a packet of 845 tons, built in 1843. Circled with a white band and painted ports.

Ship "New World," a packet of 1,440 tons, built in 1846. Circled with a white band and painted ports.

California Clipper Ship "Stag Hound," of 1,535 tons, built in 1850.

California Clipper Ship "Flying Cloud," 1,783 tons, built in 1851. The fastest clipper of her day, holding the record of 89 days from New York to San Francisco around the Horn. Her measurements, were length 225 feet, breadth 40 feet 8 inches, depth 21 feet six inches.

California Clipper Ship "Flying Fish," 1,505 tons, built in 1851. She covered the New York to San Francisco trip around the Horn in 93 days.

California Clipper Ship "Staffordshire," 1,817 tons, built in 1851. She made the run from New York to San Francisco around the Horn in 101 days, was lost in a storm off Cape Sable, in December 1854.

California Clipper Ship "Sovereign of the Seas," of 2,421 tons, built in 1852. She measured length 258 feet, breadth 44 feet, depth 25 feet 6 inches. She had the largest and sharpest bow and stern of any vessel

then built, combining the grace and beauty of McKays smaller vessels with immense strength and power to carry sail. She established several fast records that were never equalled.

California Clipper Ship "Romance of The Seas," 1,782 tons, built in 1852. A beautiful vessel with extremely fine lines, heavily sparred, and exceedingly fast. Measurements, length, 240 feet; breadth, 39 feet 6 inches; depth, 29 feet 6 inches.

California Clipper Ship "Westward Ho," 1,600 tons, built in 1852. This ship was noted for her graceful sheer, finely formed midship section and beautifully molded ends. She was one of the fastest clippers afloat and made many records. In 1853 she sailed from Boston to San Francisco in 103 days, and in 1855 she made the same trip in 100 days. She was considered one of the five fastest clippers ever built.

Australian Clipper Ship "Great Republic," 4,555 tons, built in 1853, the largest clipper ship ever built. Measured, length, 335 feet; breadth, 53 feet; depth, 38 feet. She had four decks, the upper or spar deck, being flush with the covering board and protected by a rail on turned oak stanchions. She was foremasted. Whilst loading at a New York Pier for her first trip to Liverpool she caught fire and was partly destroyed. In the rebuilding her rigging was much curtailed but even then she showed remarkable speed.

Australian Clipper Ship "Lightning," of 2,040 tons, built in 1854. Measurement, length, 244 feet; breadth, 44 feet; depth, 23 feet. On her maiden voyage to Liverpool from New York, she was 13 days 19½ hours, an average of 18½ knots. She made several other fine records.

Canadian Readers of The Modelmaker, if they so desire, can secure their copies of this paper through their local newsdealer as the London News Co. of Ontario, and the Imperial News Co. of Montreal carry it in stock.

The Post Office News Company, 31 W. Monroe Street, Chicago, Illinois, can supply the Modelmaker.

Harry Herz, Central News Company, Phoenix, Arizona, can supply the Modelmaker.

Blueprints—Design for—Scale Model of Twin-Screw Yacht. 1 Profile and deck plan, size 13" x 22". 2. Lines, three views, 7½" x 23". 2 sheets price $1.25 post paid. Spon, 120 Liberty St., New York.

Blue Prints, 3 large sheets, Single Cylinder, double acting Marine Engine with reversing gear, ⅝ in. bore, ⅝ in. stroke. Complete details and list of Materials. $2.10 registered Mail. Box 13, Modelmaker.

Blue prints, 6 large sheets, 2-Cylinder double acting Marine Engine with reversing gear, ⅝ in. bore, ⅝ in. stroke. Complete details and list of Materials. $3.60 registered Mail. Box 13, Modelmaker.

EXCHANGE

Railway Centenary; Theory of Models, & Tractive Power Chart's both in Cylinder & Wheel Diameters, etc. For back Nos. of Model Railway News, with November and December included, 1925, Charles LeRoy, Dovetail, Montana.

BOOKS FOR MODEL MAKERS

ELECTRICITY

ELECTRICAL RECREATIONS. Experiments in electricity and magnetism with directions for making the necessary apparatus. By V. E. Johnson. 158 pages, 85 illus., 8½ x 5¾ in., cloth, $2.00.

ELECTRICAL APPARATUS MAKING FOR BEGINNERS, by A. V. Ballhatchet. A practical handbook for home and school workshops, giving full particulars for making different kinds of apparatus. 164 pages, 60 illus., 7¼ x 5 in., cloth, $1.25.

MORE ELECTRICAL APPARATUS MAKING, a continuation of Electrical Apparatus Making for Beginners, by A. V. Ballhatchet. 168 pages, 85 illus., 7¼ x 5 in., limp, $1.25.

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Micrometers, Slide Gauges, and Calipers: Their Construction and Use.
Electric Hand and Cycle Lamps: Their Construction and Uses.
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HOW TO RUN ENGINES & BOILERS. Practical instruction for young engineers and steam users. By E. P. Watson. X + 160 pages, 31 illus., 7¼ x 5 in., cloth, $1.50.

STEAM ENGINES AND BOILERS. An elementary textbook on, for the use of students. By J. H. Kinealy. Sixth edition, VIII + 259 pages, 107 illustrations, 8vo., cloth, $2.00.

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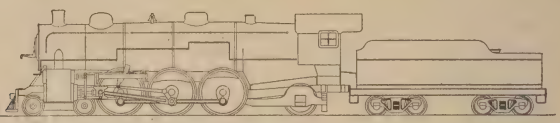

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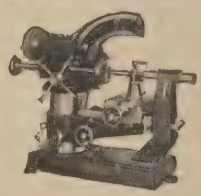

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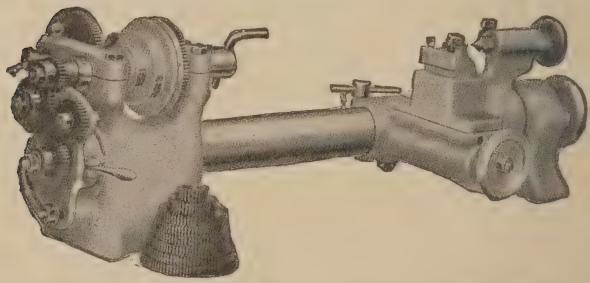

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